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,,	XXX.	June 1, ,,	pp. 121–160.
,,	XXXI.	July 1, ,,	pp. 161–200.
,,	XXXII.	Aug. 1, ,,	pp. 201–240.
,,	XXXIII.	Nov. 1, ,,	pp. 241–280.
,,	XXXIV.	Dec. 2, ,,	pp. 281–320.
,,	XXXV.	Jan. 1, 1851.	pp. 321–360.
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,,	XXXVII.	March 1, ,,	pp. 401–440.
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Plates EE, GG, HH, JJ, KK, LL, OO, PP, RR to ZZ of the animals. Plates lxxv, lxxvi, lxxx to cxxi, and cxivA, cxivB, cxivC, and cxivD of the shells.

A. Agassiz

Nahant June

A
HISTORY
OF
BRITISH MOLLUSCA,
AND THEIR SHELLS.

A

HISTORY

OF

BRITISH MOLLUSCA,

AND THEIR SHELLS.

BY

PROFESSOR EDWARD FORBES, F.R.S.,

OF KING'S COLLEGE, LONDON;

AND

SYLVANUS HANLEY, B.A., F.L.S.,

OF WADHAM COLLEGE, OXFORD.

VOLUME III.

INCLUDING THE FAMILIES OF GASTEROPODA FROM
NERITIDÆ TO ELYSIADÆ.

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JOHN VAN VOORST, PATERNOSTER ROW.

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CONTENTS OF THE THIRD VOLUME,

EXHIBITING THE FINAL CORRECTIONS AND ADDITIONS.

Species of questionable indigenousness are printed in italics; spurious and unrecognized species in nonpareil. The addition of (A. i.) to a species refers the reader to the first Appendix, or Supplementary Notes on the Acephala, in the Second Volume, (A. ii.) to the Appendix at the end of the work.

PAGE

GASTEROPODA PROSOBRANCHIATA continued.

NERITIDÆ 1
Neritina (A. ii.) . . . 2
N. fluviatilis . . . 3
N. virginea . . . 6
PALUDINIDÆ . . . 7
Paludina 7
P. Listeri (A. ii.) . . 8
P. vivipara (A. ii.) . . 11
Bithinia 12
B. tentaculata . . . 14
B. Leachii 16
Valvata 18
V. piscinalis . . . 19
V. cristata 21
V. minuta . . . 23
LITTORINIDÆ . . . 24
Littorina 25
L. Neritoides . . . 26
L. littorea 29
L. rudis . . . 33, 53
var. patula . . . 36
var. tenebrosa . . . 39
var. saxatilis . . . 43
L. ventricosa . . . 41
L. Neritiformis . . 47
L. littoralis . . . 45
L. fabalis (? var. littoralis) (A. ii.) 49, 53

Littorina continued.

L. palliata (A. ii.) . 51, 53
L. ziczac 54
L. dispar . . . 54
Lacuna 55
L. pallidula . . . 56
L. puteolus . . . 58
L. vincta (A. ii.) . . 62
L. crassior 67
L. retusa . . . 68
Assiminea 69
A. Grayana . . . 70
A. littorea (A. ii.) (as Rissoa littorea) 132
Rissoa 72
R. striatula . . . 73
R. lactea 76
R. Zetlandica . . . 78
R. crenulata . . . 80
R. calathus . . . 82
R. Beanii (A. ii.) . . 84
R. abyssicola . . . 86
R. sculpta 88
R. punctura . . . 89
R. costata (A. ii.) . . 92
R. striata 94
R. parva 98
R. costulata . . 103, 169
R. rufilabrum . . . 106
R. labiosa 109
R. inconspicua . . . 113

Rissoa continued.

PAGE
R. semistriata (A. ii.) . 117
R. rubra 120
R. cingillus . . . 122
R. vitrea (A. ii.) . . 125
R. proxima (A. ii.) . . 127
R ? fulgida . . 128, 169
R. pulcherrima . . . 129
R. soluta (A. ii.) . . 131
R ? anatina . . . 134
R. ventrosa (A. ii.) . . 138
R. ulvæ 141
R. subumbilicata . . 137
R. disjuncta (A. ii.) . . 139
R. subrufa . . . 145
R. strigata . . . 145
R. retiformis . . . 145
R. variegata . . . 145
R. elegans . . . 145
R. carinatula . . . 146
R. Binghami . . . 146
R. obtusa . . . 146
R. lactea . . . 146
R. sulcata . . . 146
R. candida . . . 146
R. turricula . . . 146
R. vittata . . . 146
R. Bruguieri . . . 146
R. decussata . . . 147
R. auriscalpium . . 148
R. calathiscus . . . 148
R. Bryerea . . . 149
R. denticulata . . 149
R. Balliæ (A. ii.)
Jeffreysia 151
J. diaphana . . . 152
J. opalina (A. ii.) . . 154
J. globularis (A. ii.)
Skenea 155
S. planorbis . . . 156
S ? nitidissima (A. ii.) . 158
S ? rota 159
S ? divisa (A. ii.) . . 161
S. serpuloides . . . 162
S ? Cutleriana (A. ii.) . . 164
S ? lævis 165
S ? costulata (A. ii.) . . 167
Planaria pellucida . . 170
Planaria alba . . . 170
TURRITELLIDÆ . . . 171

PAGE
Turritella . . . 171
T. communis (A. ii.) . . 172
T. duplicata . . . 175
T. imbricata . . . 176
T. cincta . . . 176
T. minor (A. ii.)
Cœcum 176
C. trachea 178
C. glabrum . . . 181
C. annulatum (*as Brochus*) . 181
CERITHIADÆ . . . 184
Aporrhais 185
A. pes-carbonis . . . 186
A. pes-pelecani . . . 188
Cerithium 191
C. reticulatum (A. ii.). . 192
C. adversum (A. ii.) . . 195
C. metula 198
C. angustissimum ? (A. ii.)
C. cancellatum . . . 198
C. costatum . . . 200
C. subulatum . . . 201
C. fuscatum . . . 202
Melania Matoni . . 302
SCALARIADÆ . . . 203
Scalaria 203
S. Turtonis . . . 204
S. communis . . . 206
S. clathratula . . . 209
S. Grœnlandica . . . 211
S. Trevelyana . . . 213
Vermetus . . . 216
PYRAMIDELLIDÆ . . 217
Aclis 217
A. ascaris (A. ii.) . . 219
A. supranitida (A. ii.) . 221
A. unica (A. ii.) . . 222
A. nitidissima . . . 223
Stylifer 225
S. Turtoni 226
Eulima 225
E. polita (A. ii.) . . . 227
E. distorta . . . 232
E. subulata . . . 238
E. bilineata . . . 239
Chemnitzia (A. ii.) . . 239

Chemnitzia continued.

PAGE
C. elegantissima (A. ii.) . 242
C. fulvocincta (A. ii.) (as rufa Northern form) . . 246
C. rufa (A. ii.) . . . 247
C. formosa (A. ii.) . . 248
C. fenestrata (A. ii.) . . 249
Pyramis spirolinus . . 249
C. scalaris (A. ii.) . . 251
C. rufescens . . . 253
C. indistincta (A. ii.) . . 255
C. clathrata (? var. of last) . 258
C. eximia (A. ii.)
C. gracilis or pusilla (A. ii.)
C. simillima (A. ii.) . . 245
Pyramis lacteus. . . 259
Odostomia (A. ii.) . . 259
O. conoidea . . . 260
O. conspicua . . . 263
O. unidentata . . . 264
O. striolata . . . 267
O. acuta 269
O. plicata 271
O. Eulimoides . . . 273
O. dubia (A. ii.) (? var. last) 276
O. alba (A. ii.) . . . 278
O. nitida (A. ii.) . . 280
O. glabrata . . . 283
O. Rissoides (A. ii.) . . 284
O. cylindrica . . . 287
O. insculpta (A. ii.) . . 289
O. obliqua (A. ii.) . . 291
O. Warrenii (A. ii.) . . 292
O. truncatula (A. ii.) . . 294
O. interstincta . . 296
O. spiralis. . . . 299
O. dolioliformis (A. ii.) . 301
O. decussata (A. ii.) . . 303
O. excavata . . . 305
O. Gulsonæ (A. ii.)
O ? pallida 307
O. pullus . . . 307
Eulimella (A. ii.) . . 308
E. Scillæ 309
E. acicula (A. ii.) . . 311
E. affinis (A. ii.) . . 313
E. clavula (A. ii.) . . 314

PAGE
Truncatella . . . 316
T. Montagui . . . 317
T. succinea (A. ii.)
Otina 320
O. otis 321

NATICIDÆ 324
Natica 324
N. monilifera . . . 326
N. nitida 330
Nerita mammilla . . 333
N. sordida. . . . 334
N. Montagui . . . 336
N. Helicoides (A. ii.) . . 339
N. pusilla (A. ii.) . . 341
N ? Kingii . . . 343
N. intricata . . . 344
Narica tuberosissima . 345
Narica? glabrissima . . 345

VELUTINIDÆ . . . 346
Velutina 346
V. lævigata . . . 347
V. flexilis 350
Lamellaria . . . 353
L. perspicua . . . 355
L. tentaculata . . . 358

CANCELLARIADÆ . . 360
Trichotropis . . . 360
T. borealis . . . 361
Cerithiopsis . . . 364
C. tubercularis . . . 365

MURICIDÆ . . . 369
Murex 369
M. erinaceus . . . 370
M. corallinus (A. ii.) . . 374
M. gyrinus (A. ii.) . . 376
Lachesis 376
L. minima . . . 377
Purpura 379
P. lapillus (A. ii.) . . 380
Nassa 387
N. reticulata . . . 388
N. incrassata . . . 391
N. pygmæa (A. ii.) . . 394
N. lineata . . . 397
N. ambigua . . . 397

PAGE

Nassa continued.

- N. hepatica . . . 398
- Buccinum 399
  - B. undatum . . . 401
  - B. Dalei (A. ii.) . . . 403
  - B. Humphreysianum (A. ii.) 410
  - B. fusiforme . . . 412
    - B. glaciale . . . 413
    - fry of Buccina . . . 413
- Fusus 415
  - F. Islandicus . . . 416
  - F. propinquus . . . 419
  - F. Berniciensis (A. ii.) . 421
  - F. antiquus . . . 423
    - var. jugosa . . . 423
  - F. Norvegicus . . . 428
  - F. Turtoni . . . 431
- Trophon 435
  - T. clathratus . . . 436
  - T. muricatus . . . 439
    - Fusus decussatus . . 440
  - T. Barvicensis . . . 442
    - Triton elegans . . . 443
    - Columbella picta . . 444
    - Columbella hyalina . . 445
    - Columbella cincta . . 445
    - Triton cutaceus . . . 446
    - Dolium perdix . . . 446
    - Pyrula carica . . . 447
    - Cassis testiculus? . . 447

CONIDÆ 448
- Mangelia 448
  - M. (Bela) turricula . . 450
  - M. (Bela) Treveliana . . 452
  - M. (Bela) rufa . . . 454
  - M. septangularis . . 458
  - M. nana (A. ii.) . . 461
  - M. teres 462
  - M. purpurea (A. ii.) . . 465
  - M. Leufroyi . . . 468
  - M. linearis . . . 470
  - M. gracilis . . . 473
  - M. nebula 476
  - M. brachystoma . . 480
  - M. striolata . . . 483
  - M. costata 485
  - M. attenuata . . . 488
    - M. accincta . . . 491

PAGE

Mangelia continued.

- M. multilineolata . . 492
- Murex proximus . . 479
- Fusus multilinearis . 490
- Fusus crassus . . 490
- Fusus fasciatus . . . 490
- Fusus minutus . . . 490
- Fusus punctatus . . 490
- Pleurotoma sinuosa . . 492

CYPRÆADÆ . . . 493
- Cypræa 494
  - C. Europæa . . . 495
    - C. pediculus . . . 496
- Ovula 497
  - O. patula 498
  - O ? acuminata . . . 501
- Marginella . . . 502
  - M. lævis 502
    - M. pallida . . . 505
    - M. catenata . . . 505

GASTEROPODA OPISTHOBRANCHIATA . . 506

BULLIDÆ 506
- Cylichna . . . 507, 551
  - C. cylindracea . . . 508
  - C. truncata . . . 510
  - C. obtusa (vol. iv. p. 192 and A. ii.) . . . 512
  - C. mammillata . . . 514
  - C. nitidula 515
  - C. conulus 517
  - C. strigella . . . 518
  - C. umbilicata . . . 519
    - Volvaria pellucida . . 511
    - Volvaria alba . . . 520
- Amphisphyra . . . 520
  - A. hyalina 521
- Tornatella . . . 523
  - T. fasciata 523
    - Voluta heteroclita . . 526
- Akera 527
  - A. bullata (A. ii.) . . 527
- Bulla 530
  - B. hydatis . . . 530
  - B. Cranchii . . . 533
    - B. media 535
    - B. Columnæ . . . 535
    - B. elegans . . . 535

PAGE
Scaphander . . . 536
S. lignarius . . . 536
Philine 538
P. aperta 539
P. quadrata (A. ii.) . . 541
P. scabra 543
P. catena 545
P. punctata . . . 547
P. pruinosa . . . 549

APLYSIADÆ . . . 552
Aplysia 552
A. hybrida. . . . 554

PLEUROBRANCHIDÆ . 557
Pleurobranchus . . 557
P. membranaceus . . 558
P. plumula . . . 559

DORIDIDÆ . . . 562
Doris 563
D. tuberculata . . . 563
D. flammea . . . 564
D. Johnstoni . . . 564
D. coccinea . . . 565
D. planata. . . . 565
D. repanda . . . 566
D. Ulideana . . . 566
D. aspera 567
D. diaphana . . . 567
D. bilamellata . . . 567
D. oblonga . . . 568
D. depressa . . . 568
D. inconspicua . . . 569
D. pusilla 569
D. sparsa 570
D. pilosa 570
D. subquadrata . . . 571
Goniodoris 571
G. nodosa 572
G. castanea . . . 572
Triopa. 573
T. claviger. . . . 573
Ægirus 574
Æ. punctilucens. . . 574
Thecacera 575
T. pennigera . . . 575
T. virescens . . . 576

PAGE
Polycera 576
P. quadrilineata . . . 576
P. Lessonii . . . 577
P. ocellata 578
Idalia 578
I. aspersa 578
I. inæqualis . . . 579
I. quadricornis . . . 580
Ancula 580
A. cristata 580

TRITONIADÆ . . . 582
Tritonia 582
T. Hombergi . . . 582
T. plebeia 583
T. lineata 583
Scyllæa 584
S. pelagica . . . 584

EOLIDIDÆ 585
Lomonotus 585
L. marmoratus . . . 585
L. flavidus . . . 586
Dendronotus . . . 586
D. arborescens . . . 586
Doto 587
D. coronata . . . 587
D. fragilis 588
Oithona 589
O. nobilis 589
Eolis 589

* *Eolis*

E. papillosa . . . 590
E. Peachii. . . . 591
E. glauca 591

** *Flabellina*

E. coronata . . . 592
E. longicornis . . . 592
E. Drummondi . . . 593
E. rufibranchialis . . 593
E. punctata . . . 594
E. lineata 594
E. elegans. . . . 595
E. smaragdina . . . 595
E. gracilis 595
E. pellucida . . . 596
E. Landsburgi . . . 596

PAGE
Eolis continued.
E. purpurascens . . . 597
E. alba 597
*** *Carolina*
E. stipata 597
E. inornata . . . 598
E. angulata . . . 598
E. concinna . . . 598
E. nana 599
E. olivacea . . . 599
E. aurantiaca . . . 600
E. cingulata . . . 600
E. vittata 601
E. Glottensis . . . 601
E. amœna 602
E. Northumbrica . . 602
E. arenicola . . . 602
E. viridis 603
E. cœrulea . . . 603
E. picta 603
E. tricolor 604
E. amethystina . . . 604
E. Farrani . . . 605
**** Tergipes
E. despecta . . . 605

PAGE
Eolis continued.
E. exigua 606
Embletonia . . . 606
E. pulchra 607
E. minuta 607
Proctonotus . . . 607
P. mucroniferus . . . 608
Antiopa 608
A. splendida (a. ii.) . . 609
A. cristata (a. ii.) (as splendida)
Hermæa 609
H. dendritica . . . 609
H. bifida 610
Alderia 610
A. modesta . . . 611
Runcina 611
R. viridis 614
Limapontia . . . 614
L. nigra 614
Acteonia 615
A. corrugata . . . 615
Cenia 616
C. Cocksii 616

Note. Mr. Alder and Mr. Hancock inform us of their intention to substitute the generic name *Fiona* for *Oithona* (Fam. *Eolididæ*), the latter appellation having been previously employed by Dr. Baird for a genus of Entomostraca.

BRITISH MOLLUSCA.

GASTEROPODA PROSOBRANCHIATA.

NERITIDÆ.

Among the inhabitants of our British fresh waters, is a single representative of a tribe which in warmer climates plays a conspicuous part along the shores of the ocean, and in their rivers and lakes. *Nerita* and its allies have shells of considerable solidity, more or less ovate, often expanded, with lunate mouths, bounded on their columellar side by an expanded and flattened lip. The animals have broad muzzle-shaped heads, with subulate tentacles, and prominent sus-tentacles bearing the eyes at their external bases. The foot is oblongo-triangular; its sides are not furnished with cirrhi. An hemispheric, few-whorled operculum, sometimes corneous, sometimes calcareous, is always present, and furnishes important generic characters.

Although this family ranges far back in time, even to the palæozoic epoch, its chief development is in the present era. Its affinities appear to be with the *Trochidæ*, on the one hand, and the *Paludinidæ* on the other. The genus *Natica* has been associated with it by most writers on Conchology, though, in truth, it is far removed from *Nerita*.

NERITINA, LAMARCK.

Shell hemispherically ovate, oblique, imperforate, with a spire of few whorls, last whorl very large; columella flattened, smooth, or slightly denticulated, forming a nearly straight sharp-edged border to the inner side of the hemispherical mouth; surface smooth, or striated, or spinous, protected by an epidermis; operculum obliquely lunate, solid, corneo-calcareous, with a tooth on its lower margin.

Animal with two slender tentacula, with detached eye-bearing sus-tentacula at their external bases. Foot rather short, triangularly oblong. Structure of the tongue (as observed by Lovén) complicated; each transverse series of teeth has a minute central denticle, flanked by three laterals, of which the first is largest, transversely expanded and laminar, the second and third minute, and bounded by numerous uncini, the first of them very large, broadly hooded and denticulated, the remainder narrow and linear.

The *Neritinæ* adhere to stones, and, with very few exceptions, inhabit fresh water. The greater number of species are tropical. We find unquestionable examples of this genus in fresh-water deposits of the oolitic period. The animals of *Neritina* and *Nerita* are so nearly allied, and the shells in essential features so similar, that the propriety of their separation is questioned by many malacologists. The opercula of *Neritæ* are entirely corneous, but it is yet to be seen whether this character be constant.

N. FLUVIATILIS, Linnæus.

Plate LXXI, fig. 1, 2 and (Animal) Plate H. H. fig. 1.

PETIVER, Gazoph. pl. 91, f. 3.—LISTER, Hist. Conch. pl. 141, f. 38 (badly).

Nerita fluviatilis, LINN. Syst. Nat. ed. 12, p. 1253.—PENNANT, Brit. Zool. ed. 4, vol. iv. p. 141, pl. 88, f. 142.—DA COSTA, Brit. Conch. p. 48, pl. 3, f. 8.— PULTENEY, Hutchins, Hist. Dorset, p. 50.— DONOV. Brit. Shells, vol. i. pl. 16, f. 2.— MONT. Test. Brit. p. 470.— MATON and RACK. Trans. Linn. Soc. vol. viii. p. 225.— Dorset Catalog. p. 57, pl. 16, f. 17, 18.— TURT. Conch. Dict. p. 127.— MÜLLER, Hist. Verm. pt. 2, p. 194. — DRAPARN. Moll. Ter. et Fluv. France, p. 31, pl. 1, f. 1 to 14.— BRARD, Coq. Paris, p. 194, pl. 7, f. 9, 10, 12.— C. PFEIF. Deutsch. Land und Süssw. Moll. p. 106, pl. 4, f. 37, 38, 39, and pl. 1, f. 15 (animal).—DILLWYN, Recent Shells, vol. ii. p. 998 (not var.).—WOOD, Index Testaceolog. pl. 35, f. 26.—KICKX, Moll. Brabant. Austral. p. 76.

Theodoxus Lutetianus, MONTFORT, Syst. Conch. vol. ii. p. 351.

Neritina fluviatilis, LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 576.— TURT. Manual L. and F. W. Shells, p. 138, f. 124.—FLEMING, Brit. Animals, p. 321.— GRAY, Manual L. and F. W. Shells, p. 83, pl. 8, f. 124.—MACGILLIV. Moll. Aberdeen. p. 129.— BROWN, Illust. Conch. G. B. p. 26, pl. 18, f. 1, 2, 3 ; pl. 13, f. 4, 5.— GRAS, Moll. Ter. et Fl. France, p. 69, pl. 5, f. 19. — ROSSM. Icon. L. und Süssw. Moll. pt. 2, pl. 7, f. 118, 119.—SOWERBY, Thes. Conch. vol. ii. p. 514, pl. 115, f. 178, 179, 180, 182, 185, 186.

„ *fontinalis*, BRARD, Coq. Paris, p. 196, pl. 7, f. 11.

„ *Dalmatica*, SOWERBY, Conch. Ill. Nerit. f.57.

This shell is transversely sub-oval, rounded above, flattened, and in the middle incurved lengthways, underneath, and obliquely produced in front towards the outer lip. It is not particularly glossy, is thin, smooth to the eye, yet under the lens closely and distinctly wrinkled in a longitudinal direction. The disposition of the colouring is variable, but in most of our native examples, the ground, which ranges in tint from purplish-black to madder-red, is variegated with small elongated spots, that are broader than long, of yellowish white; sometimes these are few and sparingly distributed, but in ordinary they are so crowded as to seem immeshed in a darker net-work ; not unfrequently, also, one or two lighter spiral bands are formed by the partial closer approximation of the pale markings, and the consequent tenuity of the coloured lines that divide them from each other. In some individuals a beautiful effect is produced by the whitish spots being preceded by a very dark line, and then gradually shading into the ground colour. The body-whorl is not swollen, but only moderately rounded ; towards the simple suture it is somewhat flattened, and gently shelving, whence, the base of the abruptly enlarging penult volution being more convex, and more abrupt in its declination, the spire, which is very small, being composed of only a couple of turns, that occupy a very small portion of the breadth of the shell, and are peculiarly lateral in the adult, often appears projecting, despite its extreme shortness: at times, however, it is scarcely raised. The aperture is obliquely semioval, almost occupies half the lower surface, and is of a bluish-white. The margin of the outer lip, which is somewhat disposed to expand, is a little indented posteriorly. The columellar plate is whitish, but is often margined with a fulvous yellow ; it occupies about a fourth of the lower superficies, is quite smooth, and is flat or a little concave, with a partial indentation near its pillar-margin. This last is sharp, and quite entire (not denticulated) ; its general inclination is obliquely rectilinear, but with a very slight retusion in the middle of it. The tawny operculum is edged with orange or scarlet. Most of our examples measure four lines and a third in breadth, and three lines in length.

Want of space forbids our detailing the innumerable variations of form and colour met with in foreign examples. These varieties have been elevated to the rank of species by some of the continental conchologists. In the recent monograph of the genus, by Mr. Sowerby, the following are enumerated: *zebrina*, *Peloponensis*, *Numidica*, *Mittreana*, Recluz; *thermalis*, Boubée; *intexta*, Villa; *Sardoa*, *trifasciata*, Menke; *Hildreichii*, Schwerz.

The animal is whitish, with a black head and muzzle; the foot is more or less speckled with black; the tentacles are white, with a black line running along their length; the sus-tentacles bear rather small black eyes. The creature is shy of showing much of its body in walking, a habit common to the marine as well as the fresh-water species of this group.

The *Neritina* lives in rivers having their outflow on both the eastern and western sides of England. The Thames, Trent, Ouse, and Humber, and their tributaries, the Severn and Avon claim it among their inhabitants. Mr. Jeffreys finds it at Swansea, and Mrs. Richard Smith has collected it in Blenheim lake. Mr. Peach informs us that he has taken it "once in Fowey harbour, and once on Goran beach in Cornwall, on both occasions quite fresh, and evidently derived from some of our fresh-water streams." Captain Brown states that it is found in the Tyne and Tweed, and Mr. Hogg mentions it as occurring near Stockton; but, according to Mr. Alder, the Northumberland and Durham specimens have most probably been derived from ballast. Rare near Scarborough (Bean). We have found it abundant, but dead, and undoubtedly imported with ballast, on the shores of the Firth of Forth in Fife, and doubt whether its Scottish localities enumerated by Brown (Forth, Tay, and Clyde), are not all of the same kind. Strange to say, however, it is truly living in the Loch of Stennis in Orkney, often in water more or less brackish, and under circumstances similar to those under which it occurs in the Baltic. The question of the parentage of the Orkney specimens is a curious subject for zoological speculation. In Ireland it occurs on both east, west, and south, in the Liffey, Shannon, and Lee (W. Thompson).

It is generally distributed through central and parts of northern and southern Europe.*

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* The *N. virginea* of the Conchological Dictionary (p. 127), said to have been found at Seafield, in the west of Ireland, is a foreign shell, and judging from the stated size, " hardly the eighth of an inch," and the black sutural line mentioned in the description, was rather the *Mertoniana* of Sowerby's Monograph of this genus, than his *virginea*. The specimens have been lost.

PALUDINIDÆ.

This family of fresh-water Mollusks is nearly allied to *Littorina* and its associates. With the *Neritidæ* it is connected through the intermediate exotic group of which *Ampullaria* is a member. Muzzle-shaped heads, produced tentacula, sessile or nearly sessile eyes, round or ovate entire-mouthed turbinated shells characterize the assemblage. The species it includes are distributed all over the world, inhabiting lakes and streams. All are operculated; the opercula are in most of them formed of concentric laminæ ranged round a variously-placed nucleus. Many of the *Paludinæ* are among the largest of fluviatile univalves, others among the smallest. Some are brilliantly-coloured, but usually they have a dingy brown, horn-coloured, or greenish epidermis. Species of all the following genera range as far back in time as the oolitic period, and the forms assumed by the most ancient of them closely resemble those of existing members of the tribe.

PALUDINA, Lamarck.

Shell turbinated, with a produced spire, whorls usually rounded, surface covered with a coloured epidermis; mouth more or less oval, sometimes nearly round, slightly angular above, peristome thin, continuous.

Animal with a lengthened muzzle; head bearing two tentacula, the extremities of which are setaceous, but the bases thickened by the union with them of the eye-peduncles. Tentacles of male unequal. Bisexual. Male organ concealed in the right tentacle. Mantle ample. A small veil on each side of the neck. Foot large, oblongo-triangular, obtuse and not grooved behind, bearing on a rounded lobe an operculum, which is corneous and composed of concentric elements around a central nucleus. Branchial plume single, concealed. Tongue very short, armed with transverse series of denticles, each composed of an ovate central denticle flanked on each side by three oblong lateral uncini, all with crenated apices.

The females of the Mollusks of this genus are ovo-viviparous. In autumn, according to the observations of M. Bouchard-Chantereaux,* they contain each twenty or thirty eggs. The young fry are not sent adrift by their parent until the end of the second month of their existence, by which time the bands of cilia which cover their shells have disappeared. Two, three, or four only are absolved from their mother's care in twenty-four hours, so that the entire family of a *Paludina* take some time before beginning to make their way in the world.

P. Listeri, Forbes and Hanley.

Abbreviated; whorls very and abruptly tumid; umbilicus large and open.

Plate LXXI. fig. 16.

Helix vivipara (not of Linn.), Schröter, Flüssconch. p. 330 (in part), pl. 8, f. 2. — Da Costa, Brit. Conch. p. 81, pl. 6, f. 2. — Donov. Brit. Shells, vol. iii. pl. 87. — Mont. Test. Brit. p. 386, and

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* Mémoires de la Soc. d'Agricult., &c. de Boulogne-sur-Mer. 2nd Series, vol. i. p. 217.

Sup. p. 141.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 205 (partly).—Dorset Catalog. p. 54, pl. 17, f. 2.—Dillw. Recent Shells, vol. ii. p. 940.—Wood, Index Testac. pl. 34, f. 119.

Nerita vivipara, Müller, Hist. Verm. pt. 2, p. 182.—Sturm, Deutsch. Fauna, pt. 2 (var. *a*.).

Cyclostoma viviparum, Drap. Moll. Ter. et Fluv. France, p. 34, pl. 1, f. 16, 17.

Paludina vivipara, Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 511.—Turt. Manual L. and F. W. Shells, p. 133, pl. 10, f. 118.—Fleming, Brit. Animals, p. 315 (chiefly).—Gray, Manual L. and F. W. Shells, p. 90, pl. 10, f. 118.—Brown, Illust. Conch. G. B. p. 26, pl. 14, f. 71, 72.—Brard, Coq. Paris, p. 174, pl. 7, f. 1.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 103, pl. 4, f. 42, 43.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 108, pl. 2, f. 66.—Kickx, Moll. Brabant. Austral. p. 73.—Gras, Moll. Ter. et Fluv. France, p. 66, pl. 1, f. 2.

„ *crystallina*, Gray, Medical Repository, 1821, p. 239 (fide Gray).

„ *achatina*, Sowerby, Genera Shells, Paludina, f. 1.—Reeve, Conch. Systematica, pl. 197, f. 1.

Against our inclination we have been compelled to change the appellation of this well-known shell, inasmuch as the *H. vivipara* of Linnæus is stated to be an imperforated species, and the specimens in his cabinet decidedly belong to the succeeding *Paludina*.

The shell is ovate-conoid, somewhat oblique, rather scalariform, nearly smooth, thin, semitransparent, rather glossy, and of a dark olive green, with moderately-broad spiral bands of intense rufous brown. Of these there are three subequidistant ones upon the body, the lowest of which, however, is generally nearer to the central one than the upper one is, and continues in the line of the final suture; the two superior ones traverse the penult and antepenult volutions, and then gradually become obsolete. There are six rather quickly-enlarging tumid whorls, that terminate in a very small point, and are separated by a strongly-impressed suture, but are best defined by the short but well-marked horizontal flattening of their upper edge, which contrasts strongly with the swelling roundness of the base of the preceding volution. The body, viewed dorsally, slightly exceeds the length of the spire; the base is rounded, rather short, and distinctly umbilicated. The mouth, which is obliquely rounded-oval, and projects considerably from the axis, occupies three-sevenths of the total length, and more than half of the basal diameter; the peristome is acute, simple, and of a brownish black. The outer lip is well rounded and not effuse in front, the inner one is very little reflected. Large individuals measure an inch and a quarter in length, and not much more than a fifth less in breadth. The young, according to Mr. Gray, are subglobose, pellucid, and furnished with five ciliated lines.

The animal is greyish or blackish brown tinged with orange and marked with brilliant yellow specks. Its head has a long rounded muzzle cloven at the extremity; the tentacula are long and subulate with thickened bases formed out of the eye-peduncles united with them externally, and bearing the eyes on their prominent projections; the right tentacle of the males is shorter than the left, and thickened at its extremity. Foot angulated in front, rounded behind. Mantle very lax and ample. The creature, when walking, displays itself freely, but is at times very sluggish when in confinement.

In Britain this species is chiefly confined to the southern half of England; it is reported, however, to occur at Southport in Lancashire (Brown). Mr. Bean takes it near York. It inhabits slow running rivers and canals, and is common in the Thames district. It is found in the Trent. Mr. Clark finds it in the river Ex, and Mr. Jeffreys in the rejectamenta of the river Tawe, at Swansea. A greenish white variety, without bands, has been found by Mr. Pickering in the river Lea, Herts;

and we have seen the same from near London. In Scotland, though this species does not occur, yet shells of it may be found on the banks of the Forth, derived from ballast heaps (E. F.); and Mr. Alder mentions a similar occurrence of the next species in Northumberland. Possibly the Lancashire locality recorded above may be of this kind; as also that of Newton Ards in Ireland, recorded by Captain Brown. Mr. Thompson says that he has not seen undoubtedly Irish specimens either of this or the following species.

It inhabits Central Europe generally.

P. VIVIPARA, Linnæus.

Shape more produced than in the last: whorls simply rounded and regularly shelving: umbilicus more or less concealed.

Plate LXXI. fig. 14, 15 and (Animal) Plate H. H. fig. 2.

Helix vivipara, LINN. Fauna Suecica, ed. 2, p. 529.—Syst. Nat. ed. 12, p. 1247 (from type).—SCHRÖTER, Flussconch. p. 330 (in part), pl. 8, f. 1.

Nerita fasciata, MÜLLER, Hist. Verm. pt. 2, p. 182.

Cyclostoma achatinum, DRAP. Moll. Ter. et Fl. France, p. 36, pl. 1, f. 18.

Helix compactilis, PULTENEY, Hutchins, Hist. Dorset, p. 48 (from PENN. Brit. Zool. ed. 4, vol. iv. pl. 85, top figure without name).

Paludina achatina, LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 512. — TURT. Manual L. and F. W. Shells, p. 134, f. 119. — GRAY, Manual L. and F. W. Shells, p. 91, pl. 10, f. 119. — BROWN, Illust. Conch. G. B. p. 26, pl. 14, f. 68, 69.— C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 3, p. 44, pl. 8, f. 3.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 119, pl. 2, f. 66*. — PHILIPPI, Moll. Sicil. vol. i. p. 148.—KICKX, Moll. Brabant. Austral. p. 74.—GRAS, Moll. Terr. et Fluv. France, p. 66, pl. 5, f. 13.

Turbo achatinus, SHEPPARD, Trans. Linn. Soc. vol. xiv. p. 152.

Paludina fasciata, DESHAYES, note in Lam. Anim. s. Vert. vol. viii. p. 513.— PHILIPPI, Moll. Sicil. vol. ii. p. 122.

Nerita vivipara, var. b. STURM, Deutsch. Fauna, sect. vi. pt. 2.

Paludina vivipara, SAY, American Conchology, pl. 10 (probably). — BLAINV. Manuel Malacolog. pl. 34, f. 6.—FLEMING, Treatise Mollusc. Anim. pl. 11, f. 36.

The present shell is so closely allied to the last, that we shall merely particularise the essential differences. The shape is more produced; the colouring paler; the substance generally more solid and less translucent; the whorls less swollen and regularly shelving from their suture in an arcuated line; the aperture more contracted posteriorly; the umbilicus more or less concealed. The young shells are furnished with numerous close ciliated spiral lines (Gray).

The animal closely resembles that of the last species, but its mottling is of a coppery rather than golden hue. The tentacles, muzzle and neck lobes (which are slightly unequal and plain-edged) are palest; the eye-bulgings very dark. The central and first lateral denticles of the tongue have their apical lobes more developed than in *Listeri*.

It inhabits the Thames district in similar situations with the last, and has a similar continental range.

BITHINIA, Gray.

Shell turbinated with a produced spire, whorls more or less rounded, covered with a horny epidermis; mouth ovate, slightly angular above; peristome thickened within, continuous.

Animal with a lengthened muzzle; head bearing two setaceous tentacula with eyes at the external bases. Tentacles of male equal. Male organ exserted, reflected into branchial cavity. Mantle lax. A small veil on one side of the neck. Foot oblongo-triangular, obtuse, and not grooved behind, bearing an operculum which is shelly on the inner surface, and has a subcentral nucleus. Branchial plume single. Tongue very short; similarly constituted with that of *Paludina*.

This excellent genus was very properly separated from *Paludina* by Mr. Gray. Unlike the Mollusks of the last group, the *Bithiniæ* are oviparous. M. Bouchard-Chantereaux has given an interesting account of their proceedings when laying their eggs; as this is probably not accessible to most of our readers, we quote it with slight abridgment. The *Bithinia tentaculata* lays from May to August. There are usually from thirty to seventy globular, yellowish, hyaline eggs, which are united together in a band, and attached to stones or the stems of aquatic plants. When the animal desires to lay, it seeks some smooth place, and begins to clean the surface with its mouth before commencing. That being done, it contracts its foot so as to render itself a third shorter than its usual dimensions when creeping, but also a third broader. Then, ceasing to use its mouth, it raises the centre of the anterior extremity of its foot, so as to form a little canal, intended to receive the egg. It next withdraws its head a little within the shell, and directs its muzzle towards the branchial orifice, where an egg appears which it seizes and guides into the little canal to fix it in its destined locality. Then the animal cleans the body to which it adheres anew, and deposits a second egg, repeating the operation until at last all the eggs are expelled, and arranged in riband-fashion, each band, when laid by an adult, consisting of three rows. The whole process proceeds slowly, time being left between each effort sufficient for the agglutination of the egg. The young ones emerge at the end of from twenty to twenty-five days, and do not attain full growth until the end of their second year.

B. TENTACULATA.

Whorls only moderately convex; axis imperforated, or having at most a slight umbilical chink; aperture not-projecting, subpyriformly ovate, being contracted posteriorly.

Plate LXXI. fig. 5, 6, and (Animal) Plate H. H. fig. 3.

Lister, Anim. Angl. pl. 2, f. 19; Conch. pl. 132, f. 32.
Helix tentaculata, Linn. Syst. Nat. ed. 12, p. 1249.—Pennant, Brit. Zool. ed. 4, vol. iv. p. 140, pl. 86, f. 140.—Pulteney, Hutchins, Hist. Dorset, p. 49.—Donov. Brit. Shells, vol. iii. pl. 93.—Mont. Test. Brit. p. 389. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 220. — Dorset Catalog. p. 56, pl. 21, f. 12. — Turt. Conch. Diction. p. 68.—Dillw. Recent Shells, vol. i. p. 968.—Wood, Index Testaceolog. pl. 35, f. 176.
Nerita jaculator, Müller, Hist. Verm. pt. 2, p. 185.
Turbo nucleus, Da Costa, Brit. Conch. p. 91, pl. 5, f. 12.
Cyclostoma impurum, Drap. Moll. Ter. et Fl. France, p. 36, pl. 1, f. 20.—Voith, in Sturm, Deutsch. Fauna, sect. vi. pt. 3, pl. 1.
Paludina impura, Brard, Coq. Paris, p. 183, pl. 7, f. 2. — Turt. Manual L. and F. W. Shells, p. 134, f. 120.—Brown, Illust. Conch. G. B. p. 27, pl. 14, f. 72, 73. — Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 514. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 104, pl. 1, f. 14; and pl. 4, f. 40, 41. —Kickx, Moll. Brabant. Austral. p. 74.—Rossm. Iconog. Land und Süssw. Moll. pt. 1, p. 107, pl. 2, f. 65. — Philippi, Moll. Sicil. vol. i. p. 148. — Sowerby, Conch. Manual, f. 537. — Gras, Moll. Ter. et Fluv. France, p. 67, pl. 5, f. 12.
Bithynia jaculator, Risso, H. N. Europe Mérid. vol. iv. p. 100.
Paludina tentaculata, Fleming, Brit. Animals, p. 315 (not young).—Philippi, Moll. Sicil. vol. ii. p. 122.
Bithinia tentaculata, Gray, Manual L. and F. W. Shells, p. 93, pl. 10, f. 120.— Maccilliv. Moll. Aberd. p. 124.

This early known shell is thin, semi-transparent, quite smooth, shining, and of a fulvous horn colour; in shape it ranges from ovate-acute to oblong-acute, but the latter form is by far the less frequent. It is composed of five volutions, of which the body-whorl, when viewed dorsally, is equal to the rest collectively, and whilst they are only moderately convex (and sometimes only slightly so), is generally more or less ventricose. The more produced is the shell, the less convex are the turns. The suture is distinct but fine, and the whorls, instead of jutting out abruptly, as in *Leachii*, shelve gently downwards. The general proportion of their breadth to their height is as two to one. The apex is very small, and rather pointed; the enlargement of the succeeding volution is sudden. There is no true umbilical cavity, but at most a slight crevice behind the pillar-lip, which latter is narrow, somewhat appressed, and not dilated anteriorly. The aperture is subpyriformly ovate or obovate, being contracted to a point at its posterior extremity. It occupies three-sevenths of the entire length of the shell, and not half of the greatest breadth. The outer lip is somewhat disposed to expand, and is slightly thickened within by a white ridge, which forms a support for the operculum. Our largest specimen measures a third of an inch in breadth, and rather more than half an inch in length.

Animal usually dusky, almost purplish-black, speckled with brilliant yellow, sometimes of a general pale tawny hue; muzzle long; tentacula dusky, slender, equal, scarcely thickened at their bases, and bearing near their outer bases small black eyes, on slight prominences. A single small veil on the right side of the neck. Mantle lax, but thickened at the edge. Foot oblongo-triangular, rounded behind. Denticles of the tongue with numerous very prominent linear marginal crenations.

This species is found in ditches, canals, and slow small streams throughout the greater part of England, apparently becoming rarer in the north. It is doubtfully recorded as an Aberdeenshire shell by Macgillivray, most probably from ballast; we have taken species undoubtedly from that source in the Forth (E. F.) In Ireland it is common throughout the greater part of the island. (W. Thompson).

It is distributed throughout the greater part of Europe.

As a fossil, it occurs for the first time in the mammalliferous crag.

B. Leachii, Sheppard.

Whorls tumid; aperture greatly projecting, nearly circular, not being contracted posteriorly; a distinct umbilicus.

Plate LXXI. fig. 7, 8 and (Animal) Plate II. H. fig. 4.

Bithinia ventricosa, Gray, Medical Repository, 1821, p. 239 (no description); Manual L. and F. W. Shells, p. 94, pl. 10, f. 121.
Turbo Leachii, Sheppard (March, 1822), Trans. Linn. Soc. vol. xiv. p. 152.
Paludina acuta, Fleming, Brit. Animals, p. 315.
" *similis*, Turton, Manual L. and F. W. Shells, p. 135, f. 121.
" *Troscheliana* (fide specimens from Philippi).
" *ventricosa*, Brown, Illust. Conch. G. B. p. 27, pl. 14, f. 74, 75.

The name *ventricosa* having appeared without any description, loses all claim to priority. Hence, on the principle of using that specific appellation, which has first appeared with such a definition (descriptive or pictorial) that naturalists could recognise the object intended, we are compelled to adopt Mr. Sheppard's name of *Leachii*, although that gentleman candidly acknowledges, that he received the shell from Dr. Leach, under the manuscript name of *ventricosa*. The responsibility and profound research demanded by, and generally bestowed on, a supposed new species before its printed publication, is very different from that cursory observation which leads a man, to whom in his ordinary reading an object is unknown, to term it new in a friendly correspondence, or suggest a name by which it might be referred to in the ordinary exchanges of local naturalists. Manuscript names and crude descriptions are the bane of our science, and tend more than any other cause to burthen Natural History with an oppressive and confusing mass of synonyms.

This little shell has an ovate-acute figure, and is thin, semitransparent, and of an uniform horn-colour. Its surface has a satinlike gloss, and is usually smooth; occasionally, however, the lines of increase become strongly indicated upon the base, and a few obsolete spiral ridges are barely perceptible towards the outer lip. There are from four to five tumid and deeply divided volutions, that slope inwards at their lower extremities, and instead of gradually shelving from the suture above, stand out from it abruptly and subrectangularly, so as to produce a kind of scalariform appearance. The whorls enlarge rather quickly from a not very fine and acute point; yet the body or final coil is short in proportion to the preceding one, and when viewed dorsally does not exceed the length of the spire. The base of the shell is rounded, yet compressed. The mouth, which is not contracted to an acute angle posteriorly, is obliquely subcircular, but is rather longer than broad; it occupies three-sevenths of the total length of the shell, and decidedly more than half the basal diameter, since it projects outwardly much beyond the columnar axis. The peristome is acute and continuous, but disposed to expand; it curls back a little so as partially to conceal the small but distinct umbilicus. The outline of the outer lip is more or less sinuous. The ordinary length of the shell, which is twice its breadth, is a quarter of an inch.

The animal is grey, slightly speckled with orange; its head and neck are dusky grey, the tentacula very long, greyish-white, and ringed with orange in the region of the eyes. The foot is pale-greyish white. The denticles of the tongue are not so prominently crenated as in the last species.

This shell is much rarer than the last, and appears to be confined to the south of England. It inhabits many localities in the region of the Thames, and its tributaries. Bath (Clark); Bristol, Clumber Lake, Cardiff (Jeffreys). Rare near Scarborough (Bean). It is said to occur near Preston in Lancashire (Kenyon).

Mr. Jeffreys observes, "that individuals resembling the elongated variety in Turton's collection, which that author had supposed identical with the *Cycl. viride* of Draparnaud, are met with in Greenwich marshes."

VALVATA, O. F. Müller.

Shell turbinated or discoid, thin, umbilicated, whorls much rounded, smooth, carinated or striated, covered with a corneous epidermis: mouth circular, peristome continuous; operculum horny, concentrically spiral.

Animal with a produced muzzle; its head furnished with long, cylindric tentacles, bearing sessile eyes beside their external bases; foot bilobed in front; branchial plume long, pectinated, partially exserted. Lingual armature of series of denticles, each composed of a central broad tooth with a hooked and denticulated summit, and three lanceolate denticulated hooked laterals.

This genus is of more ancient origin than is usually assigned to it. We have found unquestionable species in the freshwater beds of the oolitic period. At present it is distributed through the temperate regions of the earth, living in slow running rivers, ditches, and lakes, but presenting no great variety of shape or ornament, and but few specific forms.

V. PISCINALIS, Müller.

Spire manifestly raised above the last volution.

Plate LXXI. fig. 9, 10.

Nerita piscinalis, MÜLLER, Hist. Verm. pt. 2, p. 172.
Helix „ GMELIN, Syst. Nat. p. 3627 (from last).
Turbo fontinalis, PULTENEY, Hutchins, Hist. Dorset, p. 45.—MONT. Test. Brit. p. 348, pl. 22, f. 4. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 168. — Dorset Catalog. p. 50, pl. 18, f. 3, 4. — TURT. Conch. Diction. p. 207.—WOOD, Index Testaceolog. pl. 31, f. 87.
Cyclostoma obtusum, DRAP. Moll. Ter. et Fluv. France, p. 33, pl. 1, f. 14.
Valvata obtusa, BRARD, Coq. Paris, p. 190, pl. 6, f. 17.—TURT. Manual L. and F. W. Shells, p. 130, f. 114.—C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 198, pl. 4, f. 32, and pl. 1, f. 13 (animal).—KICKX, Moll. Brabant. p. 70.
Turbo thermalis, DILLW. Recent Shells, vol. ii. p. 852.
Valvata piscinalis, LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 504.—FLEMING, Brit. Animals, p. 286. — KENYON, Mag. Nat. Hist. vol. i. p. 425, fig. b. c. d.—ALDER, Mag. Zool. and Bot. vol. ii. p. 117. — GRAY, Manual L. and F. W. Shells, p. 97, pl. 10, f. 114.—THOMPSON, Ann. Nat. Hist. vol. vi. p. 17. —BROWN, Illust. Conch. G. B. p. 27, pl. 14, f. 62 to 65. —BLAINV. Faune Franç. Moll. pl. 12, c. f. 6.—SOWERBY, Conch. Manual, f. 322. — PHILIPPI, Moll. Sicil. vol. ii. p. 122. — MENKE, Zeitschrift Malak. 1845, p. 119. — GRAS, Moll. T. et Fl. France, p. 69, pl. 5, f. 17.
Valvée piscinale, CHENU, Traité Element. p. 470, f. 558.

Of this common shell, there are two variations in form among our native specimens, which differ strikingly from each other; in the one, the shape is comparatively long, and the umbilical cavity small in proportion; in the other, the shape is decidedly broad, the umbilicus large, and the edge of the aperture manifestly recedes anteriorly.

The general contour is orbicular-trochoid, and the shell is rather thin, a little glossy, somewhat transparent, and of a pale horn-colour, changing upon the spire into a reddish hue; the entire exterior is densely wrought with raised longitudinal wrinkles, and the last whorl or two are occasionally encircled with a few almost obsolete ridges. There are five peculiarly rounded volutions, whose increase, from a small, but very blunt apex, is moderate as to height, but rapid as to breadth. They are short, since the usual breadth of the penult is nearly thrice its width, and are divided by a suture, that from the abrupt rise of the turn above it, and a slight horizontal compression in that below it, appears profoundly distinct. The spire, which, viewed from above, is of about the same length as the body, is obtuse. The base of the shell is somewhat compressed horizontally, but still is more or less convex. The umbilicus is abrupt, and though not capacious, is tolerably large. The laterally projecting aperture is continuous, circular, disposed to expand, occupies fully one half of the basal diameter, and is about equal in length to the spire. The outer lip is acute, simple, and slightly recedes in front; it forms no angle with the erect pillar-lip, which latter curls back a little, yet is not reflected. From the obliquity of the last whorl, it lies, at the mouth, entirely or nearly below the preceding one, instead of clasping it, so that the front extremity of the aperture projects below the general level of the base. The coils of the multispiral operculum enlarge quickly near the margin. The diameter of the shell is very nearly a quarter of an inch.

The animal (which was first noticed by Montagu) is of a pale grey colour with setaceous tentacula, eyed at their external bases, and bears a tentacle-like appendage near the head on the right side. Its pellucid delicate retractile branchial plume projects from over its neck. "Between the months of May and August," writes M. Bouchard Chantereaux, "this Mollusk deposits its eggs to the number of from sixty to eighty. All are contained in a single spherical, yellowish, leathery capsule, which it fixes to stones and stems of aquatic plants. The eggs are not wholly hatched in the capsule, but about the twelfth day of its existence are partly set free through a rupture of its walls, and till about the sixteenth day, when the fry are set free, are united in a gelatinous mass."

This shell is generally distributed through the British Isles (though rare in some districts), preferring peaty localities. The variety which has been termed *depressa*, occurs abundantly in the Curraghs of the Isle of Man (E. F.); in the Clumber Lake (Jeffreys); and at Dublin (Humphreys).

It ranges through the greater part of Europe, and is known as a fossil in the later fresh-water tertiaries.

V. CRISTATA, Müller.

Spire not raised above the last whorl.

Plate LXXI. fig. 11, 12, 13.

Valvata cristata, Müller, Hist. Verm. pt. 2, p. 198.—Fleming, Brit. Animals, p. 286.—Alder, Mag. Zool. and Bot. vol. ii. p. 117.—Gray, Manual L. and F. W. Shells, p. 98, pl. 10, f. 115.—Brown, Illust. Conch. G. B. p. 28, pl. 14, f. 66, 67.—Schröt. Flüssconch. p. 240, pl. 5, f. 26.—Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 505.—C. Pfeif. Deutsch. L. und Süssw. Moll. pt. 1, p. 101.—Nils. Moll. Sueciæ Ter. et Fluv. p. 87.—Menke, Zeit. Malakoz, 1845, p. 123.

Nerita valvata, Gmelin, Syst. Nat. p. 3675.

Helix cristata, Mont. Test. Brit. vign. 1, f. 7, 8; vol. ii. p. 460.

Valvata spirorbis, Drap. Moll. Ter. et Fl. France, pl. 1, f. 32, 33.—Turt. Manual L. and F. W. Shells, p. 131, f. 115.—Brard, Coq. Paris, p. 187, pl. 6, f. 15, 16.—C. Pfeif. Deutsch. L. und Süsswas. Conch. pt. 1, p. 100, pl. 4, f. 34.

,, *planorbis*, Drap. Moll. Ter. et Fluv. France, p. 41.—Turt. Manual L. and F. W. Shells, p. 132, f. 116.

Turbo cristatus, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 169.—TURT. Conch. Diction. p. 227.—DILLW. Recent Shells, vol. ii. p. 883.—WOOD, Index Testac. pl. 32, f. 163.

A certain degree of variation is produced in this long-known species, from the looseness of its coil, which causes the spire to appear at one time nearly level, at another time somewhat sunken. The peristome at times, too, bends slightly backwards, at other times it is simple. Hence, we believe, has arisen the distinction between the *V. spirorbis* and *V. planorbis*, as it appears in certain writers; yet Draparnaud's figure of the latter exhibits a more slowly-enlarging shell than any of our adult British specimens.

The shell is discoid, thin, semitransparent, glossy, and of a rather pale horn-colour, smooth to the eye, but under the lens densely and distinctly, though partially, wrinkled in a longitudinal direction. The upper disk is flattish, the spire being rather sunken than otherwise; the middle of the lower disk is broadly and deeply excavated, and thus exposes all the preceding volutions. The three cylindrical whorls are a little flattened both above and below; they enlarge, with moderation, from a not very small apex, and are distinctly separated by a suture, that, from the abruptness of their elevation, appears the more profound. As the volutions are not very tightly coiled, nearly their entire extent is visible in the vast umbilical cavity; the flatness we have also referred to, is not apparent underneath towards the mouth: the circumference is well rounded. As the last turn does not clasp the preceding one, the aperture is circular, yet the curve, for the most part, is a little flattened upon the pillar. It occupies fully one-third of the basal diameter, is simple, acute, yet more or less expanding when adult, and manifestly projects below the basal level.

The outer lip slightly recedes anteriorly. The diameter is about the tenth of an inch.

Animal of a general dusky grey hue approaching to black on the sides of the snout and neck. Tentacles very long, greyish white ; eyes at their bases within pale prominent spaces. Branchial plume broadly triangular, very sensitive, retractile, greyish white; tentacular filament long, curved upwards, white ; foot grey, strongly and acutely bilobed in front.

It inhabits ponds and ditches in many parts of Britain ; general through the south-eastern parts, Clumber Lake, Cardiff (Jeffreys) ; Bath (Clark). In ponds at Prestwick Car, Northumberland (Alder) ; Scarborough (Bean) ; Duddingston, near Edinburgh (E. F.) ; Clare, in Ireland (Humphreys). " Distributed all over Ireland " (W. Thompson).*

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* The *V. minuta* of Turton was in all probability derived from an immature shell, but the specimens are no longer to be met with in his collection. The specific distinctness of the *minuta* of Draparnaud we have likewise doubted, and find the shell introduced in Dr. Menke's Monograph of *Valvata* (Zeits. Mal. 1845, p. 127), without any further particulars than its original most imperfect definition.

LITTORINIDÆ:

This group consists of Mollusks, living in the sea or in brackish water, having close affinities with the members of the last family, but differing in several particulars, among which the form of the operculum is conspicuous, since instead of being multispiral, or formed of numerous concentric layers, it is composed of a spire of few and rapidly increasing turns. All the shells of this family have entire mouths, but they differ greatly in form in the different genera, varying from discoid to lengthened cones. The animals are bisexual; they have muzzle-shaped heads provided with tentacula and sessile eyes. Their tongues are long and armed with transverse bands of teeth, each row consisting of a broad and hooked central denticle flanked on each side by three oblong, hooked laterals or *uncini.* The branchial plume is single. The foot has a distinct linear duplication in front, and a groove along the sole. The form and appendages of the operculigerous lobe afford important generic distinctions. There are no neck-lobes or lateral cirrhi. The mantle exhibits traces of a rudimentary canal, or respiratory fold.

Members of this group inhabit all regions of the sea, but by far the greater number live near shore, and a very considerable portion of them are found only between tide-marks.

LITTORINA, Ferussac.

Shell turbinate, solid, subconic or subglobose, with a short spire; surface smooth or spirally grooved, protected by a more or less developed epidermis; mouth subcircular, peritreme entire, outer lip sharp-edged, columellar lip expanded, imperforate. Operculum pyriform, corneous, of few rapidly increasing whorls, the spiral nucleus laterally placed.

Animal having a muzzle-shaped head, with two tentacula, bearing the eyes on bulgings at or near their external bases. No neck lobes; operculigerous lobe without filamentary processes. Foot rounded at both extremities, grooved below for the two posterior thirds of its length. Branchial plume single. Male organ rather long, linear, bent, crenated on one side, reflected into the branchial cavity. Lateral elements of the tongue subequal, and all with lobed and denticulated apices.

This excellent genus, which of all its family, approaches most nearly *Paludina*, an affinity borne out even by the minute character of its dentition, consists of an assemblage of Mollusks which formerly made part of the heterogeneous genus *Turbo*. They all live strictly between tide-marks, and many of them can exist without inconvenience in localities where the sea does little more than occasionally sprinkle them with its spray.

The *Littorinæ*, or Periwinkles, to call them by their popular name, are distributed through the seas of all climates. Fossil species are enumerated likewise from all formations, even the most ancient, but in this assignment of the range of the genus there appears to be much error, for assuredly the greater part of the fossils called *Littorinæ*, belong to quite other genera, nor do we believe that any true palæozoic examples of the genus have as yet been discovered.

L. NERITOIDES, Linnæus.

Small, smooth, ovate-conic; usually more or less black; whorls much shelving, flattish, or merely convex; spire short, but acute. Mouth angularly contracted posteriorly: outer edge of the pillar lip but little if at all concave; throat very dark.

Plate LXXXIV. fig. 1, 2.

Turbo Neritoides, LINN. Syst. Nat. ed. 12, p. 1232.—PHILIPPI, Weigm. Archiv. Nat. 1841, pt. 1, p. 271; Moll. Sicil. vol. ii. p. 159.

Helix petræa, MONT. Test. Brit. vol. ii. p. 403.

Turbo petræus, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 160. — RACK. Dorset Catalog. p. 49, pl. 18, f. 13. — TURT. Conch. Diction. p. 198. — FLEMING, Brit. Animals, p. 298. — Brit. Marine Conch. p. 165.—DILLW. Recent Shells, vol. ii. p. 820.—WOOD, Index Testac. pl. 30, f. 13. — BLAINV. Faune Franç. Moll. p. 301.

Littorina Basteroti, PAYRAUD. Moll. Corse, pl. 5, f. 19, 20.

Turbo cærulescens, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 217. — BLAINV. Faune Franç. Moll. p. 302, pl. 12, f. 9. — COSTA, Test. Sicil. p. 102. — PHILIPPI, Moll. Sicil. vol. i. p. 189. — DELES. Rec. Coquil. Lam. pl. 37, f. 6.

Rissoa elegans, RISSO, H. N. Europe Mér. fig. 46 (not of text).

Paludina glabrata, ZIEGL. in C. PFEIF. Deutsch. Land und Süsswas. Moll. pt. 3, pl. 8, f. 9, 10.

Littorina cærulea, COSTA, Osserv. Zoolog.

" *petræa*, GRAY, Zoolog. Proc. 1833, p. 116.—JOHNSTON, Berwick. Club, vol. i. p. 269. — MACGILLIV. Moll. Aberd. p. 139. — HANL. Brit. Marine Conch. p. xxxix.—BROWN, Illust. Conch. G. B. p. 16, pl. 10, f. 17. — ALDER, Cat. Moll. Northumb. and Durh. p. 56.

" *cærulescens*, POTIEZ and MICH. Galerie Douai, Moll. p. 227.

" *Neritoides*, PHILIPPI, Neue Conch. vol. ii. p. 166, Lit. pl. 3, f. 20.

Our examination of the Linnæan collection has confirmed the accuracy of Philippi's determination of this often-named shell. The original specific appellation is appropriate enough, for there is a comparative flattening of the ventral or underneath portion of the body whorl, so that an horizontal section, as in the genus *Nerita*, would be somewhat hemispherical.

The shape ranges from ovate-conic to oval-conoid, and the colouring, in our native specimens, whose hue is for the most part uniform, or only diversified by a single narrow basal zone of a whitish cast, from purplish brown to chocolate black; in the Mediterranean examples the tint is more frequently bluish grey passing into ashy white near the sutures and the base. The shell is rather thin, but not transparent; when in fine condition it is almost smooth (or with a few wrinkles of increase), and somewhat glossy, but from the ordinary exposed nature of its habitat on the British coast, is generally dull and eroded. The spire is merely composed of four short and much shelving volutions, that quickly slope to a tolerably acute point, and are divided from each other by a fine suture; although not ventricose, but merely convex, or even flattened, they are well defined. The body occupies from two-thirds to three-fourths of the entire length, the former proportion in the more produced specimens, the latter in the more abbreviated ones; its surface is not simply rounded, but flattened and shelving towards the suture, and upon the basal portion of the ventral or underneath side of the shell. The mouth occupies from one-half to two-thirds of the entire length; it is subpyriform, or oval-acute, rounded below, and contracted above to an acute angle. The two lips are connected by a broadly spread enamel, that is usually of a reddish-liver or chocolate colour; the outer lip is peculiarly sharp-edged, and disposed to expand, especially at the broadly rounded base. The pillar is wide, flat, and bevelled to a sharp edge (which is occasionally of a whitish cast); its outer or free margin is not concave, but diagonally rectilinear. The throat is smooth, always dusky, and generally almost black, with a narrow zone of white near the anterior extremity. Irish specimens are said to attain to the length of three-eighths of an inch, but the majority of our English examples only measure a quarter of an inch long, and are a third or a fourth less in breadth.

The animal has a black head and muzzle; its tentacula are pale, and on each side of each tentacle runs a dusky line. The foot has dusky, almost black sides, and is bordered in front by a white band; its disk is nearly white.

On the very edge of the high-tide mark, and often at considerable distances above it, where only the dash of the spray can moisten it with sea water, we find this pretty little mollusk assembled in myriads in the crevices of rocks, on most of our rocky shores all round Britain and Ireland, so generally distributed, indeed, that to enumerate localities would be superfluous. There are a few suitable places, where notwithstanding it is either absent or very local, as on the rocky coasts of the Isle of Man, the shores of Kent, Sussex, &c.

It is distributed all round the coasts of Europe, and extends throughout the Mediterranean, always preserving the same habitat on the very edge of the sea.

L. LITTOREA, Linnæus.

Solid, not smooth, yet rarely ridged; whorls not rounded, but more or less flattened. Base and pillar not so produced, and aperture not so filled up anteriorly as in *rudis*. Outer lip joining the body at an acute angle, and more arched below than above: pillar lip not peculiarly broad, usually white, its inner edge for the most part well arcuated.

Plate LXXXIII. fig. 7, 8, and (Animal) Plate G. G. fig. 3.

LISTER, Anim. Angl. pl. 3, f. 9; Hist. Conch. pl. 585, f. 43.

Turbo littoreus, LINN. Syst. Nat. ed. 12, p. 1232. — PENN. Brit. Zool. ed. 4, vol. iv. p. 128, pl. 81, f. 109.—DA COSTA, Brit. Conch. p. 98, pl. 6, f. 1.—PULTENEY, Hutchins, Hist. Dorset, p. 45 (partly). —DONOV. Brit. Shells, vol. i. pl. 33, f. 1.—MONT. Test. Brit. vol. ii. p. 301.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 158. — RACK. Dorset Catalog. p. 49, pl. 17, f. 1. — TURT. Conch. Diction. p. 196.—FLEMING, Brit. Animals, p. 298.— MACGILLIV. Moll. Aberd. p. 136.—Brit. Marine Conch. p. 165. —BORN, Testacea Mus. Cæs. p. 341, pl. 12, f. 13, 14.—CHEMN. Conch. Cab. vol. v. pl. 185, f. 1852. — GEVENS, Conch. (ed. Bachm.) p. 66, pl. 28, f. 315. — DILLW. Recent Shells, vol. ii. p. 817.—WOOD, Index Testaceolog. pl. 30, f. 5.—LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 199. — BLAINV. Faune Franç. pl. 12, f. 3. — PHILIPPI, Moll. Sicil. vol. i. p. 189; vol. ii. p. 159.

„ *ustulatus*, LAMARCK, Anim. s. Vert. (ed. Desh.) vol. ix. p. 214 (fide Desh., Lovén, Menke).

Littorina vulgaris, SOWERBY, Genera Shells, Litt. f. 1.—REEVE, Conch. System. pl. 222, f. 1.

Turbo rudis, BLAINV. Faune Franç. Moll. pl. 12, f. 2.

Littorina littorea, JOHNSTON, Berwick. Club, vol. i. p. 267.—Brit. Marine Conch. p. xxxix. — BROWN, Illust. Conch. G. B. p. 15, pl. 10, f. 1, 2, 3.

Litorina litorea, MENKE, Zeitschr. Malakozool. 1845, p. 49. — PHILIPPI, Neue Conch. vol. ii. p. 102, Lit. pl. 1, f. 7, 8, 10; vol. iii. p. 64, Lit. pl. 7, f. 12 (monstrosity).

Like most littoral shells, the species of this genus are liable to great changes of shape and colour: the former arises chiefly from the amount of elevation displayed by the spire. Hence the form ranges from subglobose to ovate-acute, which last we regard as the most ordinary and characteristic appearance. The shell is solid, a little glossy, and its colouring is either of an uniform tint, or disposed in rings. Impure scarlet, black, fulvous, or brown, are the usual tints; the two latter are often zoned with numerous narrow fillets of red, or smoke-colour. There are six or seven volutions divided by a fine and simple suture, and terminating in a more or less acute apex. They are spirally girt with densely disposed raised striæ, which, however, are, for the most part, much more manifest in the young, than in the aged specimens, where the surface, from abrasion, exhibits merely the intervening striæ. The shelve of the whorls is considerable, that is to say, they are much broader below than above; they are flattish, or plano-convex, and never much rounded. The proportion of body to spire is very variable; occasionally they are almost equal; in the produced form, the dorsal length is in general as two to one; in the globular form, the spire hardly occupies more than a fourth of the entire length. There is very often, especially in the more elongated specimens, a slight disposition to retusion beneath the suture of the body-whorl. The aperture is large, ovate, disposed to obliquity, and more or less contracted posteriorly. The outer lip runs at a very acute angle to the body, and typically (in the adult), is more arcuated anteriorly than posteriorly, the base of the shell being broad in the more characteristic examples. The pillar-lip is broad, plano-convex, or flattened (not retuse), and white; it is not particularly thickened at its union with the outer lip: its free edge is moderately concave, its inner, or attached margin, is greatly arcuated. The throat is smooth, and usually of a chocolate-brown: more rarely the entire mouth is white. The larger of the specimens we have delineated is fully the average size of fine individuals. As a general rule, it may be remarked that in the banded varieties of this and *rudis*, the colouring-matter is usually disposed in narrow rings in the former, in broad zones in the latter. The outer lip, in the present species, is more frequently margined internally with the darker external colouring; in *rudis*, it is more apt to be pallid, or tinged with orange-yellow.

The animal above is of a general dark hue, arising from close-set brownish-black linear markings on a yellowish or tawny ground. The lanceolate tentacula are irregularly ringed with these markings, as is the muzzle also. The operculigerous lobe is rounded, pale, and tawny, with few markings. The sole of the foot is yellowish-white. Lovén describes the tongue as having broad and quadrate central teeth, with strongly inflexed apices, consisting of a cordate central lobule, flanked by obtuse denticulations on each side: the uncini are nearly all alike, thick, and have unequally lobed and toothed apices.

This is pre-eminently the "Periwinkle" of our shores, a name said to be a corruption of petty winkle. Mr. Searles Wood says that they are called "Pinpatches" in Suffolk. Great quantities are sold in London, and eaten on many parts of our coast, after being boiled, when the animal is extracted by means of a pin. It is a poor man's delicacy, but by no means to be despised. It inhabits the third sub-region of the littoral zone,* or belt, between tide-marks, that of which *Fucus articulatus* and *F. nodosus* are the characteristic plants, and is found so generally around our shores, that we need not enumerate localities. Occasionally specimens much distorted are taken, apparently when an influx of fresh water has effected their growth, and to some such cause, possibly to the melting of icebergs, we may attribute the curious monstrosities of this species which occur in the red and mammaliferous crags, such as those figured by Mr. Searles Wood in his excellent work on the Crag Mollusca. It is found along the Atlantic shores of Europe, ranging southwards as far as Asturias.

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* See Memoirs of the Geol. Survey of Great Britain, vol. i. p. 373.

L. RUDIS, Donovan.

Solid, rarely ridged; whorls rounded, spire acute, more or less short. Mouth small, more or less rounded, not contracted above, but lessened at the base by the broad confluence of the pillar and outer lip, which latter is rather more arched above than below, and joins the body at nearly right angles. Base generally a little produced.

Plate LXXXIII. fig. 1, 2, 3, 5, 6, 7, and Plate LXXXVI. fig. 1.

Turbo rudis, DONOV. Brit. Shells, vol. i. pl. 33, f. 3.—MONT. Test. Brit. p. 304. —MATON and RACK. Trans. Linn. Soc. vol. viii. p. 159, pl. 4, f. 12?, 13.—RACK. Dorset Catalog. p. 49, pl. 18, f. 6.—TURT. Conch. Diction. p. 197.—FLEMING, Brit. Anim. p. 298 (part.)—Brit. Mar. Conch. p. 166.—DILLW. Recent Shells, vol. ii. p. 818. —WOOD, Index Testac. pl. 30, f. 7.—LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 216.—DELES. Rec. Coquil. Lam. pl. 37, f. 5.

„ *littoreus*, MATON and RACK. Trans. Linn. Soc. vol. viii. pl. 4, f. 10, 11? (from which BROWN, Ill. Conch. pl. 10, f. 5, 6).—RACK. Dorset Catalog. pl. 19, f. 3 (probably).

Littorina rudis, (not of Gould), JOHNSTON, Berwick Club, vol. i. p. 267 (var. *a*.).—MACGILLIV. Moll. Aberd. p. 137 (chiefly).—Brit. Marine Conch. p. xxxix.—BROWN, Illust. Conch. G. B. p. 15, pl. 10, f. 10 to 14, 25.—MENKE, Zeitschr. Malakozool. 1845, p. 53.—PHILIPPI, Neue Conch. vol. ii. p. 103, Litt. pl. 1, f. 14, 15, 16.

„ *zonaria*, BEAN, Brit. Marine Conch. p. 266.

„ *nigrolineata*, GRAY in Zool. Beechey Voyage, p. 140 (probably).—PHILIPPI, Neue Conch. vol. ii. p. 104, Litt. pl. 1, f. 17, 18, 19.

„ *littorea*, BROWN, Ill. Conch. G. B. pl. 10, f. 4.

This strong shell closely resembles the preceding, but does not attain to its size, and chiefly differs from it in the roundness of its well-defined volutions. It is sometimes almost smooth, sometimes spirally girt with indistinct costellar striæ (in which case those upon the base are the most prominent) and very rarely (yet occasionally in an orange and livid banded variety, where the ridges are obsoletely subtubercular) strongly costellated. The colour ranges from yellowish-white to orange, and is either uniform or banded with about two or three zones of liver-colour or chocolate, of which one at least is broad; the throat varies in tint from chestnut to dark chocolate-brown; the peristome in the paler varieties is pure white, in the darker ones is tinged with different intensities and shades of liver-colour. Occasionally also (but not commonly) the shell is livid and the zones, if present, pale yellow.

The form of the most typical examples is subglobose-conic, but, as in the common periwinkle, the spire varies greatly in relative height, and the more produced it is, the longer is the shape of the body. The basal portion of the body is almost always flattened, narrowed, and rather elongated; when the cessation of roundness is abrupt, a slight angularity is perceptible upon the final whorl. The mouth of the adult is small in proportion to the extent of its outer circumference, the cavity being greatly diminished through the space occupied by the thickened basal junction of the two lips; it is rounded oval (more rarely circular) and not contracted posteriorly. The junction of the outer lip, which is acute, disposed to expand, and more arched posteriorly than anteriorly, is subrectangular; hence its ordinary marked projection. The attached edge of the columella is often a little elevated, and is comparatively straight (in *littorea* it is much arcuated). The pillar is plano-concave, and abruptly dilated, being remarkably broad at the anterior base, where it is often disposed to become slightly effuse and to twist a little to the left. The parietal enamel is generally rather thick in adult individuals. The throat is quite smooth. An umbilicoid indentation is occasionally perceptible.

Our largest specimen only measures nine lines and a half in length, and eight lines and a third in breadth.

We are inclined to regard the *nigrolineata*, as defined by Philippi, as an aberrant form of this species. The chief peculiarity arises from the spiral sculpture being elevated into regular ribs that are separated by profound sulci, and are often bifid near the outer lip. At times, too, the angle formed by the junction of the outer lip with the body is almost as acute as in *littorea*, from which the shape of the pillar and the anterior filling up of the aperture suffices to distinguish it. The most characteristic style of colouring is where the shell is tawny, and the sulci brown or almost black; sometimes, too, the entire shell is pure white, or painted with two broad fulvous zones; sometimes of a bright yellow, either with or without two broad spiral bands, in whose livid tint the projecting costæ do not, for the most part, participate; the margin of the mouth in the banded examples is more or less stained with reddish purple.

The shell figured as *jugosa*, in Montagu's "Supplement (pl. 20, fig. 2) to the Testacea Britannica" (not that originally described as such), looks like an aberrant ridged variety of this very variable species. At least what we suppose to be identical (pl. LXXXVI. fig. 1) appears to be so. It is smaller and rather less solid than the more typical forms, is coarsely and sharply ridged, has a rather more abbreviated or globose contour, and a rather larger aperture. The colour is usually of an uniform scarlet or brown, but sometimes the ridges are white, whilst their intervals (as well as the mouth of the shell) are of a chocolate or dark brown tint. The basal declination is abrupt and subretuse. There are only four or five volutions, which are very distinctly defined; those of the spire are very short, so that the body is usually twice the length of the rest united, a character that distinguishes the shell from the ridged variety of *tenebrosa*, wherein the smaller whorls are much more produced. The principal ridges (those above the basal slope) are about six in number, and are separated by rather broader interstices. The mouth is rounded oval, and very projecting; the pillar is broad; the base a little produced.

The animal differs from that of the preceding species, in being of a lighter hue, with the exception of the head, which is more uniformly dusky. The dark markings are not arranged in bars, and the tentacles instead of being ringed, are dusky, with a pale yellowish line down the centre of each. The edge of the muzzle and base of the foot are yellowish, or yellowish white. Mr. Clark has observed that this animal, unlike the last, is viviparous; " in July and August all the ovaria are full of completely formed young shells."

The *Littorina rudis* is found almost everywhere on stony and rocky shores, often in considerable numbers, though not strictly gregarious. It inhabits the first and second subregions of the Littoral zone, those of *Fucus canaliculatus* and *Lichina*, usually below the next species, and always within the reach of the tide. Its continental range is like that of *littorea*.

L. PATULA, Jeffreys.

Subglobose, not particularly solid, almost always marked with raised wrinkles or ridges. Whorls four, at most five; the penult not shelving above, but abruptly swollen, and peculiarly longer than the preceding turn. Spire short; apex bluntish. Aperture rounded oval, not diminished in size by any broad basal confluence of the very prominent outer lip, whose superior junction with the body-whorl is more or less rectangular: pillar lip not produced, rounded anteriorly.

Plate LXXXV. fig. 6 to 10, and (Animal) Plate G. G. fig. 2.

? *Turbo jugosus*, MONT. Test. Brit. vol. ii. p. 586.—TURT. Conch. Diction. p. 196, from which Brit. Marine Conch. p. 257, as *Littorina jugosa.*—DILLW. Recent Shells, vol. ii. p. 820.
,, ,, RACKETT, Dorset Catalog. p. 49, pl. 19, f. 1.
Littorina patula, JEFFREYS, Brit. Marine Conch. p. 259, f. 7.
,, *labiata*, BROWN, Illust. Conch. G. B. p. 16, pl. 10, f. 20, 21.
,, *rudissima*, ALDER, Catal. Moll. Northumb. and Durham, p. 55.

The largest example of this species delineated in our engravings, presents a remarkable degree of likeness to some of the stunted and costellated forms of *tenebrosa*; so much so, indeed, that we do not venture positively to assert the specific distinctness of the two shells. Since, however, the examination of a long suite of specimens, has not clearly proved to us the union of the two, we have preferred to retain a constituted species, rather than wrong the author of it, by too hasty a suppression. The chief distinguishing characters appear to be the remarkable swell of the penult whorl, and its extreme dorsal length compared to the shortness of the succeeding volution. The absence of all indication of this character in Montagu's figure of *jugosa* prevents our recognition of his species, although his description of that shell applies better to the present *Littorina*, than to any other we are acquainted with.

The shape is subglobose when young, and becomes more or less obliquely globular-acute when adult. The shell is never solid, but, at most, seems moderately strong: the colouring is variable, the exterior being sometimes clear yellow or orange, sometimes white, and sometimes almost black; it is occasionally, too, mottled with brown and white (in which case the mouth is of a chocolate colour). The more ordinary tints, however, range from a somewhat olivaceous drab to intense brown, changing, for the most part, into a darker hue upon the spire, and a paler one at the base. Adult ringed or banded varieties must be very rare, as we have never met with them, but the younger shells are not unfrequently mottled, and sometimes even streaked with white. The whorls, which are five in number, are either encircled with numerous raised wrinkles, which become almost obsolete on the basal area, or else are girt with more or less strong and distant ridges, that diminish in size below the basal declination. The first three volutions are remarkably small, but the penult becomes suddenly larger (being decidedly longer than the united preceding ones), and, as well as the body, much rounded. From this tumidity the suture is peculiarly distinct, particularly in a variety, where the body is horizontally flattened posteriorly. The apex is very small, but is not prominently acute: the spire appears to occupy, at most, a third of the entire dorsal length, more frequently only a quarter, and a still smaller proportion in the younger examples. The base is not at all produced, its surface is less convex than the portion above it, and the commencement of its declination (usually rather an abrupt one) is generally, in a slight degree, subangulated. The aperture is rounded oval, not contracted above, usually of a paler or darker chocolate-colour, and occupies from, at least, four-sevenths to fully one half the entire length of the shell. The outer lip is simple, acute, and peculiarly projecting and rounded, especially posteriorly, where its junction with the body is nearly subrectangular. The pillar (in the adult) is almost equally broad throughout, somewhat concave, and not at all produced; the length of the mouth is but little diminished by its confluence with the outer lip.

We have figured an oblique and patulous variety, of which we possess two forms, one resembling the type in its possession of riblets, the other actually smooth upon the body-whorl towards the outer lip. The colouring of the latter, which is evidently the *labiata* of Brown, is pale yellow, adorned with encircling interrupted streaks of reddish brown.

The characters of its aperture distinguish it from the aberrant ridged variety of *rudis* so specially indicated in our description of that species; for, in that shell, the anterior extremity of the mouth is filled up by the broad confluence of the suddenly expanding pillar with the outer lip. The acuteness of its apex, its comparative solidity, and the more shelving roundness of its penult volution, aid us in separating it from its closely allied congener.

The majority of individuals do not exceed the third of an inch in length or breadth, but one of our specimens of the wrinkled or typical variety, measures nearly half an inch in either direction. This specimen was obtained from the vast pile of rocks near the caves in Freshwater Bay, Isle of Wight (S. H.), where the species is met with in abundance, along with *petræa* and *rudis*, each preserving, however, its peculiar situation upon the same stone.

The ridged forms are procured both on the north and south coasts of Great Britain; Newbiggin and Salcombe (Alder).

The animal is of a general yellowish-white hue; the whole of the upper part of the head is covered with purplish lineations; the extremity of the muzzle is yellowish-white. The tentacles are subulate, yellowish-white, lineated on each side with a fine black stripe; their bases are much swollen, and bear the eyes on the outer bulgings. A few purplish lines mark the sides under the tentacles. The foot is oblong, rounded at each end, margined in front, and conspicuously grooved in the centre.

This species is viviparous, and assembles in vast numbers gregariously on rocks at the edge of high water-mark, and often considerably above that limit. Its abundance in many localities where *rudis* is absent or rare, would seem to bear out its distinctness. It is found all round our coasts, and has a foreign distribution similar to that of its near allies.

L. TENEBROSA, Montagu.

Usually more or less thin, very rarely solid; of an ovate-conic, or oblong-conic shape, the spire being always more or less developed. Whorls six, much rounded, not abruptly enlarging. Mouth rounded oval, its base usually rounded, and not produced: pillar not broadly confluent at its junction with the outer lip.

Plate LXXXIV. figs. 11, 12; Plate LXXXV. fig. 1 to 5.

Turbo tenebrosus, MONT. Test. Brit. vol. ii. p. 303; Suppl. pl. 20, f. 4.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 160.—RACK. Dorset Catal. p. 49.—TURT. Conch. Diction. p. 197, f. 36, 37.—FLEM. Brit. Anim. p. 298.—DILLW. Recent Shells, vol. ii. p. 817.—WOOD, Index Testac. pl. 30, f. 6.

„ *littoreus*, MATON and RACK. Trans. Linn. Soc. vol. viii. pl. 4, f. 8, 9?

„ *vestitus*, SAY, Journ. Acad. Philadelph. vol. ii. p. 241.

Littorina tenebrosa, FORBES, Malac. Monens. p. 18. — MACGILL. Moll. Aberd. p. 138. — Brit. Marine Conch. p. xxxix. f. 92 (changed from *Turbo t.* p. 166). — BROWN, Ill. Conch. G. B. p. 16, pl. 10, f. 18, 19. — GOULD, Invert. Massachus. p. 259, f. 175*.—DEKAY, New York Moll. p. 105, pl. 6, f. 106.

Of this shell there are two varieties, the one ridged, the other smooth, that pass imperceptibly into each other; of these we regard the latter, which is by far the commoner, as the normal form.

The shape ranges from ovate-conic to oblong-conic, the larger examples being ordinarily the less produced ones. The colouring is very variable, being yellow, purplish-chocolate, livid brown, scarlet, or chocolate brown; in the latter case, with an occasional zone of orange in the middle of the body-whorl. Sometimes, too, the surface is equally and rather broadly zoned with orange red and dusky brown. A not unfrequent and very characteristic style of painting, is where a ground, that ranges from fulvous brown to almost black, is mottled by irregular but somewhat spirally disposed, short angulated streaks of white, yellow or orange. The texture is often thin, rarely, if ever, solid, and at most is moderately strong; the surface has but little lustre, and ranges in sculpture, from almost smooth, or merely impressed with very fine and undulated spiral lines, to spirally ridged. There are six much rounded and often very bluntly subscalariform volutions that terminate in a rather fine apex, and rather slowly increase in length, though they quickly enlarge in breadth; of these the lower ones are peculiarly well defined, the rise from the suture being almost perpendicular. The spire, viewed from above, occupies from three-sevenths to one-half of the entire length; the penult whorl is about half as long as it is wide. The body whorl is always short (compared with our native species), and is sometimes nearly half again as broad as it is long; it is well rounded, though a little flattened in the middle, and its basal declination is, for the most part, low down, and rather sudden. The mouth, which occupies rather more than one half the length in the shorter specimens, rather less than that proportion in the produced ones, has an ovate contour, and is not contracted posteriorly; its colour, if not that of the exterior, is chocolate brown. The outer lip is never thickened, is moderately arcuated, and is united to the body at almost a right angle. The pillar lip, which sometimes twists a little to the left, shelves inwards and is somewhat dilated at the base of the shell; its inner or attached edge is arcuated and a little raised. A large specimen of nearly eight lines in length, measured six lines in breadth; another produced and smaller sized example, five lines long, only measured a quarter of an inch across.

Strange to relate, although the typical forms of *rudis*, *tenebrosa*, *patula*, and *saxatilis*, are so very unlike, certain aberrant individuals almost indicate, that they form but one species. We have figured some specimens (pl. lxxxiii. fig. 4, and pl. lxxxv. fig. 3, 4) that almost connect the first three forms, but the greater production of the spire, the proportional and slower increase of the turns, and the possession of an additional volution, induce us to refer them to the present heading.* These shells, and certain allied forms, fairly enough agree with the *Turbo jugosus* of Montagu's description (Test. Brit. vol. ii. p. 586.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 158, pl. iv. fig. 7, probably. —Dillw. Recent Shells, vol. ii. p. 820, probably.—Brown, Illust. Conch. G. B. pl. x. fig. 16, probably), but not with his representation of it in the Supplement. The *Littorina jugosa* of writers seems to be constituted from the strongly ridged varieties of the three species just mentioned by us.

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* The unfigured *L. ventricosa* of Brown's Illustrations (p. 16), is probably one of these links between *tenebrosa* and *patula*. We have not, however, observed any specimens that precisely correspond to it. We transcribe the description of its characters from the work alluded to:—" Shell rather thin, smooth, conic, ventricose, body large, and the spire small, measuring only one-third of the length of the body, consisting of four inflated, deeply separated volutions, and terminating in a rather obtuse apex; the superior part of the body, and volutions of the spire somewhat flattened above, giving them a subcarinated appearance; aperture subrotund, dark burnt umber brown within; outer lip thin, slightly inflected, and of

The animal of this *Littorina* does not appear to present characters which will enable us to pronounce it distinct from *rudis*. It inhabits muddy flats and inlets all round our coasts, and has a distribution correspondent with that of its preceding congeners.

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a rich fawn colour at the edge ; pillar lip broadly reflected on the columella, a little concave in the centre, and of a brownish purple colour ; the whole exterior surface covered with zigzag markings of a deep reddish brown, and dull wood-brown, yellowish towards the margin of the lip ; a few obsolete lines of growth can be discerned crossing the body. Length, nearly five-eighths of an inch; breadth, nearly half an inch. Found by James Macdonald, Esq., adhering to stones near high-water mark, in Clew Bay, county of Mayo, on the west coast of Ireland.

"We have also received a variety, which is obsoletely sulcated spirally on the body, with the apex a little more acute, and the depression on the upper part of the volutions less conspicuous, and having a pale buff coloured spiral band on the upper margin of the body and volutions, close to the suture, and terminating in the apex.

"This shell is somewhat allied to both the *Turbo tenebrosus* and *labiatus ;* it differs from the former in being less elongated, and in the body being much larger in proportion to the spire ; and from the latter, in the body being less in proportion to the spire, and in the aperture being greatly smaller."

L. saxatilis, Johnston.

Minute, thin, subglobose, smooth, or obscurely striated. Whorls only four, the penult peculiarly big, and, as well as the body, which is broader than long, tumid ; base short, much rounded : apex blunt. Aperture suborbicular, rather more than half the length of the shell, broadly rounded, and not filled up anteriorly : pillar attenuated below : outer lip peculiarly arcuated, meeting the body almost at right angles to it.

Plate LXXXVI. fig. 4, 5.

Littorina saxatilis, Johnston, Berwick Club, vol. i. p. 268.—Macgil. Moll. Aberd. p. 138, from which Brit. Marine Conch. p. 258.—Alder, Moll. Northumb. and Durh. p. 56.—Philippi, Neue Conch. vol. iii. p. 66, pl. 7, f. 16.

„ *neglecta*, Bean, Brit. Marine Conch. p. 266.

As Olivi had described a *Littorina* under the name *saxatilis*, the appellation *neglecta* has been substituted for that of the present species. We revert, however, to the specific epithet by which our shell was first designated, because we consider that the Italian author has not sufficiently defined his species to secure its positive identification. Moreover there can be little doubt that he meant the *Littorina Neritoides.*

This minute shell seems to us more like a smoothish dwarf form of the *L. patula*, but as Philippi, in his recent monograph of this genus, sanctions the species, we have unwillingly retained it. When most typical it is of a globosely subconoid shape, and of equal length and breadth, is generally a little glossy, thin, typically smooth, but occasionally with obscure raised spiral lines, and for the most part is of a whitish ash-colour, painted with an irregular net-work or tessellation of obliquely subspiral wavy linear streaks of an olivaceous brown or dusky smoke colour ;

more rarely it is of an uniform brownish black. There are only four volutions, of which the first two are obscurely defined (the apex being almost always eroded, but apparently blunt) and very short; the penult, by comparison, is remarkably big, but its breadth is full double its height; the body somewhat ample, but rather broader than it is long. These two last whorls are simply tumid, and swell out at once, without any depression of surface, from the very distinct suture. The body is twice the length of the spire; the base is short, and its declination, though sudden, is well rounded. The aperture, which is rather capacious, the basal portion not being filled up by any broad confluence of the lips, occupies rather more than one half the length of the shell; it is longitudinally suborbicular, scarcely, if at all, contracted posteriorly, and broadly rounded anteriorly: the throat is chestnut or rufous brown. The outer lip, which is simple and acute, is peculiarly arched, and fully as much so below as above: its junction with the body is rectangular. The free edge of the pillar-lip is straightish (compared to the outer lip), its attached margin is arcuated: the pillar is simple, short, and neither twisted nor produced anteriorly, but tapering. The specimens we have described from, measure only the eighth of an inch in either direction.

This shell is abundant in many localities on both our eastern and western coasts, and is probably a common species. On the rocky shores of the Isle of Man we have gathered it abundantly in the crevices of the rocks beside *Corallina officinalis.* Mr. Alder and Mr. Hancock remark that on the Northumberland coast it is found "on rocks near low-water mark, bare of sea-weed, but covered with *Balani* and muscle. The habitat of this little species is different from that of the preceding, being always near low-water mark. This, with the difference of form and size, induce us to think it distinct. We have taken from its body embryos well developed and covered with a shell."

L. LITTORALIS, Linnæus.

Semiglobose, solid, smooth, or at most striolate, the general surface flattish. Body bluntly subangulated above, peaked below in the young; spire remarkably depressed, its whorls not rounded; pillar-lip decidedly broad.

Plate LXXIV. fig. 3 to 7.

LISTER, Anim. Angl. pl. 3, f. 11, 12, 13; Hist. Conch. pl. 607, f. 40, 44. — KNORR, Délices des Yeux, pt. 6, pl. 23, f. 8, 9. — CHEMN. Conch. Cab. vol. v. pl. 185, f. 1853 and 1854, Nos. 1, 4, 5, 6, e. f.

Nerita littoralis, LINN. Syst. Nat. ed. 12, p. 1253; Fauna Suecica, ed. 2, p. 533. —PENN. Brit. Zool. ed. 4, vol. iv. p. 141, pl. 87, f. 143.—DA COSTA, Brit. Conch. p. 50, pl. 3, f. 7, pl. 4, f. 2, 3.— DONOV. Brit. Shells, vol. i. pl. 20, f. 2.—MONT. Test. Brit. vol. ii. p. 467.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 226, pl. 5, f. 15. — RACK. Dorset Catalog. p. 57, pl. 16, f. 13 to 16; pl. 20, f. 2, 3.—TURT. Conch. Diction. p. 126.—FLEMING, Brit. Anim. p. 318. — DILLW. Recent Shells, vol. ii. p. 989.—WOOD, Index Testac. pl. 35, f. 27.

Turbo Neritoides (not of Linn.), PULTENEY, Hutchins, Hist. Dorset, p. 44.— Malacolog. Magaz. p. 28.—Brit. Marine Conch. p. 171.— LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 214. — BLAINV. Faune Franç. Moll. p. 301, pl. 12, f. 8. — GEVENS, Conch. Cabinet (ed. Bachmann, 1830), p. 67, pl. 28, f. 318, 319, 320. —PHILIPPI, Moll. Sicil. vol. i. p. 189.

„ *retusus*, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 215. — POTIEZ and MICH. Gal. Douai, Moll. p. 316, pl. 29, f. 11.—BLAINV. Faune Franç. Moll. pl. 12, f. 7.

„ *obtusatus*, LAM. (not Linn.) Anim. s. Vert. (ed. Desh.) vol. ix. p. 216 (probably).

„ *ustulatus*, BLAINV. Faune Franç. Moll. p. 301, pl. 12, f. 6.

Littorina Neritoides, FORBES, Malac. Monens. p. 19.—JOHNSTON, Berwick Club, vol. i. p. 269.—MACGILLIV. Moll. Aberd. p. 140.—Brit. Marine Conch. p. xxxix. — BROWN, Illust. Conch. G. B. p. 25, pl. 13, f. 14, 15, 21, 22.

Littorina obtusata, Menke, Zeitsch. Mal. 1845, p. 55. — Lovén, Index Moll. Scandinav. p. 22.—Philippi, Neue Conch. vol. ii. p. 104. Litt. pl. 1, f. 20, 21, 22.—Middend. Malac. Rossic. pt. 2, 3, p. 57, pl. viii, f. 24—28.

Of this very common shell there are two marked variations in shape, besides subordinate ones. We propose to describe the more typical of these first, and then to indicate the peculiarities of the other variety. This form has a transversely, and generally obliquely, oval contour, is opaque, very solid, more or less dull, and of various shades of yellow, rufous, or brown, either uniform, or banded with the first on a ground of either of the two darker colours, or *vice versâ.* Oftentimes, too, it is reticulated by closely-disposed zig-zag lines, that radiate at first from the sutures in simple curves. The surface is nearly smooth under its epidermis, being only, at most, very finely and densely striolate in a spiral direction. The spire is remarkably depressed, and composed of about three-and-a-half turns, that at first slowly, and then quickly enlarge, and commence from a blunt yet very small apex: they are scarcely raised, very gently shelving, flattened above, more convex below, and separated from each other by a very fine suture, over which the succeeding whorl is wont to lap. The great disparity in length between the dorsal and ventral surfaces of the penult turn is very characteristic of the species. The body is ample, placed obliquely with respect to the other volutions (so that the spire is lateral), and usually produced at the anterior base in full-grown examples; it is bluntly subangulated above, gently shelving and a little flattened below, and plano-convex in the middle, hence the circumference opposite the mouth, instead of being rounded, as in most *Littorinæ*, is broadly and slightly convex. The aperture which is rounded oval, yet a little contracted posteriorly, and broadly rounded anteriorly, owing to the thickness of the shell, is small compared to the peristome ; its colouring is either whitish, or tinged with violet, liver colour, or chocolate. The extreme length of the peristome is fully two-thirds of the total length of the shell, its breadth decidedly exceeds one-half of the basal diameter. The outer lip is bevelled to an acute edge, is disposed to expand, recedes considerably at the base, is well rounded anteriorly, and is gently arched and much shelving posteriorly. The pillar lip, which is glossy, and shelves much inward, is broad, and less flattened than in most British species of this genus ; it is broadly confluent with the outer lip, being chiefly, and rather suddenly, dilated at the base of the shell, near which its outer or free margin is concave, but becomes straighter as it recedes thence. The margin of the enamel, which surmounts the pillar in adult specimens, is straightish or incurved. A linear indentation for the most part bounds the inner margin of the columella. In immature examples the mouth is narrower, being longitudinally oval, and is produced and attenuated anteriorly.

In aged specimens, the final whorl is apt to become suddenly deflected at its termination, which causes the spire to seem much more elevated, and the length of the shell to become equal to its breadth.

In the other variety, the body not being so obliquely placed in regard to the lesser volutions, the general shape is much more globose, and the angularity of the final whorl much less conspicuous ; the spire is more raised, and the aperture more oval. The outer lip, too, is generally thinner, and the minute spiral wrinkles more wavy.*

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* The *L. Neritiformis* of Brown (Ill. Conch. G. B. p. 17, pl. 10, f. 24), whose description we here transcribe, seems to be a somewhat distorted form of this

The breadth of a full-sized individual of the former variety was three quarters of an inch, and its length only half; an example of the latter variety measured seven and a half lines broad, and seven lines long.

The animal is usually of a bright yellow colour, but occasionally, as in a variety we have taken in the Isle of Man, is tinged with dusky, and has the tentacula and muzzle nearly jet black. The former organs are slenderer than in its congeners, and the eyes placed rather farther back. The mantle in the former variety is edged with orange, in the latter with a black line. The operculum is tinged with rich brown.

This species is abundant all round the British and Irish coasts, living on *Fuci*, between tide-mark, but more especially inhabiting the third subregion of the Littoral zone, that of *Fucus serratus*, where it is found in company with *Trochus cinerarius*. It ranges along the shores of the Northern and Celtic provinces on the European side of the Atlantic.

species:—" Shell strong, subconic, smooth; spire very short, being about one-fourth of the length of the body, consisting of four well-rounded volutions ending in an obtuse apex; body large, tumid, crossed by some obscure lines of growth, its upper margin provided with a narrow spiral groove, which continues throughout the volutions; aperture subrotund, dark purplish brown within, pale fawn colour within the margin of the inner lip, which is thin, and not continuous; pillar lip glossy, white or pale reddish purple, broadly reflected on the columella, with a very slight subumbilicus behind. Length nearly five-eighths; breadth upwards of three-eighths.

" We discovered this species adhering to rocks below high-water mark, near Downpatrick, Ireland, where it is very plentiful."

L. fabalis, Turton.

Very small, thin, yet usually broader than long, subglobose, reticulated by chestnut markings, devoid of spiral striæ or ridges. Spire very depressed; body well-rounded, not peaked at the base; pillar-lip rather narrow.

Plate LXXXVI. figs. 2, 3.

Turbo fabalis, Turt. Zoolog. Journ. vol. ii. p. 366, pl. 13, f. 10. — Fleming, Brit. Anim. p. 298.—Brit. Marine Conch. p. 167.
Littorina Beanii, Macgilliv. Moll. Aberd. p. 140.
„ *fabalis*, Brit. Marine Conch. p. xxxix. — Brown, Illust. Conch. G. B. p. 17, pl. 10, f. 38, 39.—Philippi, Neue Conch. vol. iii. p. 66, Litt. pl. 7, f. 18.

As the fry of *littoralis*, which assumes at times the colouring and general aspect of this species, is occasionally marked as such in the cabinets of collectors, we may observe that even in that early stage it is a more solid shell, is peaked and somewhat produced at the base, and exhibits a wider confluence of pillar and outer lip.

This little shell has a rather obliquely subglobose form, is rather broader than long, thin, a little transparent, slightly or scarcely glossy, of an orange-brown, loosely reticulated by rufous lines, and is apparently smooth; numerous longitudinal wrinkles, however, may be discerned by the magnifying glass, and a lens of high power discloses, likewise, faint traces of densely disposed spiral striulæ. The spire is very short, occupying only the sixth or even the fifth of the total length; it consists of two whorls and a half, that are separated by a fine but profound suture, increase rather quickly in length, and terminate in a small but bluntish apex. Although not ventricose, they are convex, but are little elevated, and very gently shelving. The body is very ample, swollen and elevated in the middle, convexly shelving above, and abruptly but still convexly declining to a rounded termination anteriorly. From the suddenness of the basal slope, and the recedence of the outer lip in front, the shell appears, when viewed from above, to lean considerably forward. The mouth is ample, being equal in size to the rest of the ventral area, and occupying about five-sixths of the total length ; it is rather obliquely prominent, especially anteriorly, is longer than broad, and of an oval-suborbicular contour. The outer lip is very thin, well arcuated both above and below, and recedes considerably at the base of the shell. The pillar, which is shining, flattish, or even a little hollowed, and of a paler or darker liver-colour, is concave at the free or outer edge, and arcuated at the other margin ; hence it is apt at times to bear a narrow crescent-like form ; it manifestly shelves inward, and is more or less broad, yet less so at its confluence with the outer lip, than it is higher up. There is often a little indentation at the ordinary site of the umbilicus in other genera. Our largest example only measures the fifth of an inch across, and is a trifle less in length.

The confusion attending the history of this minute *Littorina*, prevents our indicating its distribution with accuracy, and saying more than that it was first discovered at Scarborough, by that indefatigable and observant Conchologist, Mr. William Bean, to whose researches in this branch of Natural History we owe our warmest thanks. Mr. Jeffreys possesses specimens gathered on the Northumberland coast by Mr. King. He considers it a variety of *littoralis*.

L. PALLIATA, Say.

Subglobose, smooth, not solid; whorls convex; body rounded; basal confluence of the two lips not broad; outer lip acute and much arcuated.

Plate LXXXIV. fig. 8, 9, 10.

Turbo palliatus, SAY, Journ. Acad. Nat. Sc. Philadelph. vol. ii. p. 240.
Littorina palliata, GOULD, Invert. Massach. p. 261, f. 176*. — PHILIPPI, Neue Conch. vol. iii. p. 68, Litt. pl. 7, f. 27, 28, 29 (well).

The only two native specimens of *palliata*, which we have ever examined, those delineated in our engravings, were taken on the coast of Yarmouth, Isle of Wight, by our friend Mr. Metcalfe. Both these individuals having been lost by our engraver, we are compelled to derive our outline of the distinctive characters from examples sent us from the United States, where the species is most abundant.

Shell subglobose, broader than long, not at all flattened underneath, not solid, yet moderately strong, variable in colouring, olivaceous yellow, or brownish red; tint either uniform, or banded, or reticulated with the darker hue. Surface smooth, or at most densely and spirally striolate. Whorls about five, those of the spire convex; the first two or three extremely small, the penult very large in proportion to them; the body rounded, and occupying from two-thirds to three-fourths of the entire length, its basal declination not at all angulated, but abruptly though arcuatedly sloping. Suture very narrow. Mouth capacious, suborbicular, scarcely longer than broad, usually occupying about two-thirds of the shell in the adult, but a less proportion in the young, usually chocolate-brown, broadly rounded below. Outer lip very acute, much arcuated. Pillar-lip not suddenly broad; its outer edge very concave. Length four lines and a half; breadth five lines.

The more convex whorls, the rounded body, and the absence of any broad basal confluence of the two lips, distinguish it from *littoralis.* Mr. Sowerby assures us that similar specimens, whose identity with *palliata* was unquestionable, have been taken on the south coast of England.

In the preceding account of the British *Littorinæ*, several are described as species which many of our ablest naturalists regard as varieties, whilst others are considered varieties which some hold to be worthy of specific rank. Our own belief is that even the list we have given assigns too high a rank to several forms; but in order that this difficult subject should be so treated as to enable those who may have opportunity, to work it out still more completely, we have described provisionally as species the leading types or most striking forms, even at the risk of laying too much stress on transient characters.

Our conviction is that the result of a completed knowledge of this genus would be a reduction in the number of true British species. Taking the most permanent features of the animal and its shell as our guide, we are inclined to reduce the true specific types to four.

1. Littorina neritoides; a form which is so distinct in animal and shell that it has not been subdivided like its neighbours, nor confounded with them.

2. Littorina littorea; the characters of the animal are constantly different from those of *rudis;* the shell rarely

resembles too closely that of the next species; and the habitat is constantly different. The animal, moreover, is oviparous. It is possible that occasionally hybrids may be produced between it and *rudis*, which may account for the rare specimens contained in a few cabinets exhibiting an apparent combination of the characters of both.

3. Littorina rudis. This is the form which has been most divided into so-called species. We believe, with Mr. Jeffreys, that *patula*, *tenebrosa* and *saxatilis*, with the many less distinct varieties which we have enumerated under this synonymy will eventually prove to be this species modified by variations in the habitat. The animals of all too nearly resemble each other, and have the common character of being viviparous. Of the more remarkable varieties *patula* and *saxatilis* are rock-inhabiting specimens, the former living mostly on the edge of high-water mark, the latter in crevices near the low-water line, whilst *rudis* inhabits stones within the half tide belt, and *tenebrosa* muddy and brackish water localities. They have all a power of maintaining life for a long time out of the water; this they possess in common with many mollusks exposed to the air at the fall of the tide. Mr. Barlee has observed it in *Trochus lineatus*, which species he has kept alive away from the sea for as many as eighteen days, whilst *ziziphinus* rapidly perished.

4. Littorina littoralis. Under this species, which in several respects, especially in the features of the animal, approximates the *Littorinæ* to the *Lacunæ*, will probably fall *fabalis*, and, we feel almost sure, *palliata*.

SPURIOUS.

L. ZICZAC, Chemnitz.

Trochus ziczac, CHEMN. Conch. Cab. vol. v. p. 69, pl. 166, f. 1599 (not var. f. 1600.) — GMELIN, Syst. Nat. p. 3587 (not var.).—DILLW. Recent Shells, vol. ii. p. 808, var. *a*.
Turbo „ MATON and RACK. Trans. Linn. Soc. vol. viii. p. 160. — MONT. Test. Brit. Suppl. p. 135.—TURT. Conch. Diction. p. 199.
Phasianella lineata, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 243, in part.
Littorina ziczac, POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 280, pl. 28, f. 11, 12.—DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 204.
Litorina „ PHILIPPI, Neue Conch. vol. ii. p. 162, Lit. pl. 3, f. 13, 14.

A common W. Indian shell, introduced by Maton and Rackett, under the belief that it was identical with a shell figured by them (pl. 4, *f.* 14, 15, *copied by Brown, loc. cit. pl.* 10, *f.* 26, 27), *and taken by Lady Wilson, near Sunderland. This last is supposed by Mr. Alder (Moll. Northumb. and Durh. p.* 57) *to be identical with* Neritoides.

L. DISPAR, Montagu.

Turbo dispar, MONT. Trans. Linn. Soc. vol. ix. (1811), p. 195, pl. 13, f. 4.—TURT. Conch. Diction. p. 199.
Cingula „ FLEMING, Brit. Anim. p. 309.—Brit. Marine Conch. p. 184.
Littorina „ BROWN, Illust. Conch. G. B. p. 16, pl. 10, f. 26, 27.

Probably a native of the W. Indies; introduced by Montagu, whose figure of it is very exact, as found at Poole in Dorsetshire. It comes between Neritoides *and* Mauritiana *in appearance, but is distinct from either.*

LACUNA, Turton.

Shell turbinate, solid or thin, obliquely conoidal or subglobular, spire short or produced, surface smooth (in the British species) protected by an epidermis; mouth ample, rounded, peritreme entire, not continuous, outer lip sharp-edged, columellar lip expanded, grooved, umbilicated. Operculum semicircular, corneous, of few rapidly increasing whorls, the spiral nucleus lateral and subterminal.

Animal having a muzzle-shaped head, with two long tentacula, bearing eyes or bulgings at their external bases. No neck-lobes; operculigerous lobe expanded or winged laterally and furnished behind with two filamentary processes, more or less developed, but sometimes nearly obsolete. Foot rounded at both extremities, contracted at the sides, centrally grooved. Branchial plume single. Male organ long, thick, compressed, placed near the right tentacle. Lateral elements of the tongue heterogeneous; two of the *uncini* as well as the median denticle with incurved (five) denticulated apices.

The mollusks of this genus, which was instituted by Turton, and is one of the most natural groups of its order, were formerly confounded with *Natica*, and, even now, are frequently associated by conchological authors with genera to which they have no near affinity. They live upon sea-weed, usually inhabiting the fronds of *Laminaria* and *Fucus*, in the zone of which the former plant is characteristic; more rarely ranging to greater depths. The peculiarities of the animal were first described by Philippi.

Lovén states that their ootheca are vermiform, thick, and curved in a semicircle.

The species are mostly of northern seas. Their geological range is not yet clearly understood.

L. PALLIDULA, Da Costa.

Almost always broader than long, flattened beneath, peculiarly expanded at the mouth: lacuna large in the adult, and equal to two-thirds the length of the shell, sometimes absent in young specimens.

Plate LXXII. fig. 1, 2, and fig. 3, 4 (as *patula*).

Nerita pallidula, DA COSTA, Brit. Conch. p. 51, pl. 4, f. 4, 5. — DONOV. Brit. Shells, vol. i. pl. 16, f. 1.—MONT. Test. Brit. vol. ii. p. 468. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 226. — RACK. Dorset Catalog. p. 57, pl. 20, f. 4, 5.—DILLW. Recent Shells, vol. ii. p. 986.—WOOD, Index Testac. pl. 35, f. 21.
Turbo pallidulus, TURT. Conch. Diction. p. 192, f. 24, 25, 85, 86.
Natica pallidula, BLAINV. Faune Franç. Moll. pl. 14, f. 6. — FLEMING, Brit. Animals, p. 320. — Brit. Marine Conch. p. 150. — BROWN, Illust. Conch. G. B. p. 25, pl. 13, f. 18, 20.
Lacuna „ TURT. Zoolog. Journ. vol. iii. p. 190. — JOHNSTON, Berwick Club, vol. i. p. 270. — MACGILLIV. Moll. Aberd. p. 145. — HANL. Brit. Marine Conch. p. xxxii. f. 85.
„ „ *var. ? patula*, HANLEY, Brit. Marine Conch. p. xxxvii. f. 83.

The broad canal and *Natica*-like aspect of this most characteristic species of *Lacuna* readily enable us to separate it from its British congeners. It is flattened underneath, but above is almost hemispherically convex, and of a somewhat obliquely subtriangular-ovate form, that is for the most part broader than long, but occasionally is somewhat more circular than usual. From its thinness it is a little translucent, and is covered with a rather dull and dirty yellow epidermidal coat, beneath which the shell is of a whitish hue, and never banded nor variegated with any other colour. The surface is almost smooth; numerous wrinkles of increase, and occasionally a few very obscure spiral ridges may, however, be descried. Of the three volutions which compose the shell, the two upper scarcely occupy any appreciable portion of its area, being not only very narrow, but also scarcely raised and very lateral: although much shelving they are rounded. A slight horizontal retusion or flatness under the suture, which is simple, but quite distinct, is principally observable upon the body-whorl. This last is remarkably ample, enlarging with great rapidity from the previous turn; it is much dilated towards the outer margin, is well rounded in the middle, but has its basal surface a little flattened. The apex is small, but not acute. The aperture is more than semicircular, but much longer than it is broad: it is greatly projecting, and very capacious, for it decidedly occupies more than one half of the lower superficies of the shell. The outer lip is simply and continuously arched, and disposed to expand; it unites with the inner lip posteriorly at nearly right angles, its anterior junction is devoid of angularity. The general inclination of the white pillar-lip is almost perpendicular, yet slightly retuse: its lacuna or canal is remarkably broad and long, reaching two-thirds up the shell, where it terminates in a large funnel-shaped umbilicus: it is abruptly defined, and almost overhung, as it were, by the body, and although rather profound is not more particularly excavated in the middle than elsewhere. Our larger specimens measured five lines in breadth, and about four lines in length.

The shell, erroneously called *L. patula* in our plates, is the immature state of a large olivaceous variety of this species. Its form is subtriangular, being very broad at the top and attenuated at the basal extremity; the subsutural canal is peculiarly distinct. The mouth is peculiarly capacious, and is scarcely surmounted by the spire; it is longer than broad, and somewhat ear-shaped. The chief peculiarity is the entire absence of a lacuna, except when the shell is mature, in which stage of growth it resembles the typical form, but is more solid and usually olive-coloured. It is common enough on a cluster of submerged rocks, a mile or two from the shore of Torquay in S. Devon (S. H.). An extremely flattened variety is taken at Sunderland, (S. H.) that reminds us not a little of the *Coriocella perspicua*. Mr. Jeffreys finds it on the Mumbles, near Swansea.

The animal, with a sketch of which we have been favoured by Mr. Alder, is white; its tentacles are long, subulate, bearing eyes on the outsides of their slightly swollen bases; the muzzle is rather narrow; the foot is rounded at each end, and slightly contracted at the sides centrally; the operculigerous lobe is broadly margined at each side, and bifurcated behind; the two tail-like furcations are subulate and rather short, though conspicuous, and extending beyond the end of the foot. In our plate we have given a drawing of the changes of form in this species during its development, observed and kindly communicated by our esteemed correspondent, Mr. Spence Bate, of Swansea.

Although much more common in the north than in the south, this mollusk is very generally distributed around the British shores, living on the characteristic sea-weeds of the Laminarian zone. It is very fine and abundant in the Firth of Forth.

L. PUTEOLUS, Turton.

Small, subglobose, often zoned, never of an uniform yellow; pillar canaliculated.

Plate LXXII. fig. 7, 8, 9; LXXIV. fig. 9.

Cochlea parva, DA COSTA, Brit. Conchol. p. 85, pl. 8, f. 12.
Helix fasciata, ADAMS, Trans. Linn. Soc. vol. v. p. 5, pl. 1, f. 20, 21 (badly), from which Mont. Test. Br. p. 446. — MATON and RACK.

Trans. Linn. Soc. vol. viii. p. 205. — Turt. Conch. Diction. p. 57.

Helix lacuna, Mont. Test. Brit. p. 428, pl. 13, f. 6.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 201. — Dillw. Recent Shells, vol. ii. p. 917.—Wood, Index Testac. pl. 33, f. 70.

Nerita rufa, *var.* Mont. Test. Brit. Suppl. p. 151.

Turbo lacuna, Turt. Conch. Diction. p. 193, f. 87, 88, 89.

„ *puteolus*, Turt. Conch. Diction. p. 193, f. 90, 91.

Lacuna „ Turt. Zoolog. Journ. vol. iii. p. 191. — Brit. Marine Conch. p. xxxviii.

„ *Montacuti*, Turt. Zoolog. Journ. vol. iii. p. 191.

Turbo fasciatus, Fleming, Brit. Animals, p. 300.

Natica lacuna, Fleming, Brit. Animals, p. 320.—Brit. Marine Conch. p. 150.—Potiez and Mich. Galerie Douai, Moll. vol. i. p. 292.

Lacuna fasciata, Macgilliv. Moll. Aberdeens. p. 145. — Brit. Marine Conch. p. 256, f. 84. — Brown, Illust. Conch. G. B. p. 128, pl. 10, f. 54 (changed from *Phasianella fasciata*, p. 10).

„ *sulcata*, Macgilliv. Moll. Aberdeens. p. 146 (fide Jeffreys from type).

„ *Montagui*, Brown, Illust. Conch. G. B. p. 128, pl. 57, f. 8.

The members of the genus *Lacuna* require a studious examination of long suites of examples collected from various localities, in order to arrive at just conclusions respecting the natural limits of each species. Our grouping together the very dissimilar forms that we have included under the name of *puteolus*, is the result of such an examination, and is forced upon us, contrary to our preconceived ideas, by the observation of numerous connecting links between the several varieties. We propose to describe at large the typical form (the *L. puteolus* of the "Zoological Journal," *Turbo lacuna* of "Turton's Dictionary"), and then to indicate the more peculiar aberrations from its ordinary characteristics.

The shape is nearly globular, and the shell, when adult, is comparatively strong, and hence not particularly translucent. It is covered with a thin dull yellowish horn-coloured skin, beneath which the surface is either of an uniform livid white, for the most part changing to an obscure violet upon the spire, or else is alternately marked upon the final volution with zones of whitish and chocolate brown, or sometimes, though very rarely, carnelian red. Of these bands, there are three light, and three dark ones, commencing with the former, besides the narrow whitish strip that surrounds the pillar; all, excepting the second darker zone, which is broader than the rest, are almost equally narrow; occasionally the entire shell is tinged with the darker hue, so that the zones in consequence become obscure; sometimes, but almost wholly in worn individuals, the colour is lilac or dirty rufous. The closely disposed longitudinal wrinkles of increase are often strongly indicated. There are from three to four volutions that end in a blunt, but very small, and generally white apex, which are only separated by a simple suture, yet are very distinctly defined, owing to their more or less abrupt rise, roundness, and horizontal compression above; the last character is, however, at times almost obsolete, especially in abraded examples. The rapid increase in size is not confined to the last volution, for the penult turn, likewise, is quickly enlarged. The dorsal length of the body is three times that of the spire (which is occasionally so short, that it does not project beyond the penult turn when viewed dorsally), and is either broadly rounded in the middle, or else is angulated above, and plano-convex in the middle; the base is short, abrupt in its declination, and usually either straightish or retuse. The aperture, whose length, which at the least is two-thirds that of the entire shell, is greater than its breadth, is suboval and much projecting. The outer lip is almost semicircular, and manifestly recedes towards the base. The pillar-lip is white, solid, rather flat, decidedly broad, not much shelving, scarcely at all oblique, nearly straight at the edge; it occupies half the total length of the axis. It is indented near the moderate-sized umbilicus, with a tolerably profound and broad canal, that in general does not extend down to the anterior extremity; but occasionally does so. The *Turbo puteolus* of " Turton's Dictionary," is a sub-variety of this form, in which the shape is more like *pallidula*, being depressed, rounded, and obliquely produced; the pillar and groove are consequently broader.

It is by this last modification that we are led into the peculiarly aberrant *fasciata*, the ordinary northern form of this species. In this variety, the banded colouring is redder, and, for the most part, better defined than in the type, the zones are generally continued upon the penult turn, and the apical whorls are pale or liver-coloured, instead of violet. The shell is thinner, smoother, and glossier; and the shape, although occasionally precisely that of the type, is usually more obliquely produced, and hence less globular. This alteration in the general contour proportionately affects the several parts likewise. The looser coiling of its whorls, which are rounded and more shelving, causes the spire to become more elevated, so that it occupies nearly two-fifths of the total length of the shell. The pillar-lip is arcuated, narrower, and more elongated than in the type; it is canaliculated throughout, and its inner margin sharply defined by the overhanging edge of the body whorl.

Our own specimens scarcely measure a quarter of an inch in either direction; but Turton's are stated to have been nearly half an inch across.

The animal, in such specimens as we have taken alive, is entirely of a pale yellow or tawny colour, with the exception of two dusky dots or lines on the top of the muzzle. The head is rather large, with a prominent and rather broad snout, and long subulate tentacles bearing conspicuous black eyes on the outsides of their thickened bases. The foot is rather short, rounded at both ends, and contracted in the middle, so as often to assume an hour-glass shape. It is grooved medially below. The operculigerous lobe, though large, is not developed to the same extent as in the neighbouring British species; but appears like a ledge on each side of the pale yellow operculum, and has the two caudal filaments reduced to points or almost obsolete.

This pretty and variable shell is very generally distributed all round our shores, though perhaps not quite so plentiful as *vincta*. Like it, it inhabits the Laminarian region. Abroad, it ranges from the shores of Norway (Lovén), to as far south as Vigo Bay in Spain (M'Andrew).

L. VINCTA, Montagu.

More or less oval-conoid, the length invariably exceeding the breadth; spire more or less raised; canal very distinct.

Plate LXXII. fig. 10, 11, 12; LXXIV. fig. 7, 8; LXXXVI. fig. 6, 7, 8; and (animal) Plate G. G. fig. 4.

Turbo divaricatus, (not of Linn.) O. FABRIC. Fauna Grœnlandica, p. 392? fide Lovén.

.. *vinctus*, MONT. Test. Brit. vol. ii. p. 307, Suppl. pl. 20, f. 3.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 167.—TURT. Conch. Diction. p. 195, f. 92, 93.—Brit. Marine Conch. p. 168.—DILLW. Recent Shells, vol. i. p. 844.—WOOD, Index Testac. pl. 31, f. 69.

,, *canalis*, MONT. Test. Brit. vol. ii. p. 309, pl. 12, f. 11.—TURT. Conch. Diction. p. 195.

Helix ,, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 220.—DILLW. Recent Shells, vol. ii. p. 968.—WOOD, Index Testac. pl. 35, f. 178.

Turbo quadrifasciatus, MONT. Test. Brit. p. 328, Suppl. pl. 20, f. 7.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 167.—TURT.

Conch. Diction. p. 194.—Fleming, Brit. Animals, p. 299.—Brown, Illust. Conch. G. B. p. 16, pl. 10, f. 35. —Dillw. Recent Shells, vol. ii. p. 845.—Wood, Index Testac. pl. 31, f. 70.—Lovèn, Index Moll. Scandinav. p. 22.

Lacuna quadrifasciata Turt. Zoolog. Journ. vol. iii. p. 191.

" *vincta*, Turt. Zoolog. Journ. vol. iii. p. 192.—Johnston, Berwick Club, vol. i. p. 273.—Macgilliv. Moll. Aberdeen. p. 143.—Brit. Marine Conch. p. xxxviii. (changed from *Turbo v.* p. 168).—Brown, Illust. Conch. G. B. p. 9, pl. 10, f. 46.—Philippi, Wieg. Arch. 1836, pt. 1, p. 231, pl. 8, f. 4.—Gould. Invert. Massach. p. 265, f. 178.*—Dekay, New York Moll. p. 111, f. 119.

„ *canalis*, Turt. Zoolog. Journ. vol. iii. p. 192.—Brown, Illust. Conch. G. B. p. 9, pl. 10, f. 48.

„ *pertusa*, Conrad, Journ. Acad. N. S. Philadel. vol. vi. p. 266, pl. 11, f. 19.

„ *vincta var.? gracilior*, Metcalfe, Brit. Marine Conch. p. xxxviii. f. 86.

„ *divaricata*, Lovèn, Index Moll. Scandinav. p. 23.

„ *cornea* and *bifasciata*, Brown, Ill. Conch. G. B. p. 10, pl. 10, f. 47, 44, 45.

„ *striata*, Brown, Ill. Conch. G. B. p. 10, pl. 10, f. 49 (probably).

A wide amount of differences is exhibited in the several varieties of this abundant shell; differences, however, so evidently arising from *proportionate* modifications of the same normal form,—a criterion we esteem important in determining the narrow limits between specific and varietal distinction—that in accordance with, and perhaps a little in deference to, the opinion of the great collectors of the present day, whose ample store of specimens in every stage and circumstance of growth, affords them the best of data for arriving at an accurate decision, we have united the *vincta*, *canalis*, and *quadrifasciata* of Montagu under one common appellation.

In the most characteristic examples of *vincta*—and such we consider those individuals to be, which in shape are most dissimilar to the other British *Lacunæ*—the form is oblong-conical, passing into ovate-conical, and the shell is thin, transparent, a little glossy, and apparently smooth, yet when closely examined exhibits for the most part (especially upon the body-whorl) a dense array of minute and rather indistinctly indented spiral lines. Beneath the delicate pale buff or fulvous horn-coloured epidermidal skin, the surface is either of an uniform whitish tint, or else is banded with four narrow zones of chestnut or chocolate brown. Of these, the first of which seems always to commence at some small distance from the sutural line, there are four upon the body-whorl, two of which are generally continued upon the succeeding turn. In the variety *bifasciata*, which is generally smaller, and sometimes broader than in the type, the bands unite in two broad pairs, that are frequently of a dark flesh-colour. There are five quickly increasing whorls, of which the apex is small and blunt, and the body (viewed underneath) occupies from three-fourths to three-fifths of the entire length of the shell. Their attenuation above is always rapid, but their height and degree of convexity is subject to much variation; the whorls, however, are always more rounded below than above, and as a general rule it may be observed, that the shorter is the shell, the more rounded, horizontal, and abbreviated are its turns, and the more ample is the mouth; the more elongated the figure, the more produced flattened, and oblique are its volutions, and the smaller is the aperture. No angularity is ever observable (as in *crassior*) beneath the simple suture. The basal declination of the body is generally sudden, and its commencement occasionally subangular, though more usually rounded. The mouth is longer than broad, is ovate or rounded ovate, and in general is equal or superior to half the length of the shell; but in the slender variety (*gracilior*) only occupies about two-fifths of it. The outer lip is acute, simple, disposed to project and expand, is much arcuated above, but somewhat straightened at the anterior base, where it manifestly recedes. The white pillar-lip, which terminates near the junction of the outer one in a moderate-sized but distinct umbilicus, is profoundly canaliculated, and overhung by the body-whorl; it varies in breadth, but in general is moderately broad, and its free edge, which is generally sunken, is slightly concave, and leans a little away from the outer lip. Our larger specimens measure five lines in length, and three and a half in breadth.

What we regard as the *canalis* has an ovate-acute figure, and a rather short spire whose whorls are simply rounded. The body is a little flattened in the middle, and at times is distinctly angulated at the beginning of the basal declination, which produces a corresponding effect upon the aperture. The breadth of the penult turn is twice its length. The mouth, which shares in the general abbreviation, is nevertheless very large, and occupies more than one half of the total length. The pillar-canal is very wide. The dwarf variety *quadrifasciata* bears much resemblance to this form, but is solid and still more stunted; the basal angulation is rendered peculiarly distinct from the surface of the body being decidedly flattened in the middle. The pillar is broad in proportion to the width of the canal.

Through the kindness of Mr. Alder we are enabled to figure the Cullercoats specimen (pl. lxxxvi. f. 7) from which he described his *L. labiosa* (Moll. Northumberland and Durham, p. 58). From the profound respect we entertain for the opinion of that excellent naturalist, we have refrained from citing his species as a synonym of *vincta*, to which nevertheless two North British specimens in our own cabinet approximate it so closely, that we cannot venture to rank it among our species of *Lacuna*.

"*L. labiosa*, Lovèn? Ovate-oblong, tapering, whitish, rather solid, with five whorls, very slightly convex, the last occupying rather more than half the shell, and rounded or very slightly carinated below. Outer lip a little expanded, and thin at the edge, within which it is thickened by a callosity which extends round the base of the aperture uniting with the expanded columellar margin below. Umbilical groove small. Length a quarter of an inch, breadth one and a half tenths.—In sand at Cullercoats. The shell is thicker and more slender than *L. vincta*, and is somewhat intermediate between it and *L. crassior*."

We have figured likewise (pl. lxxxvi. f. 8) one of the two Northern specimens referred to, which perfectly agrees with Lovèn's somewhat succinct description in the "Index Molluscorum Scandinaviæ." The other has precisely the shape of *vincta*, but the outer lip is pink and a little thickened internally, so that its base is more broadly confluent than usual with the columella, characters which connect it with the delineated specimen, which is rather solid and of an uniform pinkish colour externally.

The animal was first described and figured by Philippi in 1836, from specimens of the variety *canalis*. Through the aid of Mr. Spence Bate we are enabled to give an original figure taken from the form *quadrifasciata*. Dr. Johnston describes it fully in the valuable "Transactions of the Berwickshire Naturalists' Club." "It is of a pale flesh-colour, the proboscidiform mouth reddish orange, the sides and sometimes the head dusky or black; tentacula setaceous, contractile, the eyes on short pedicles (*i. e.* bulgings) at their base; foot oval, rounded at both ends, widest behind, the anterior end capable of being extended considerably beyond the head, the margins plain, but there are two very short filaments between the hinder part and the operculum. It swims on the surface in a reversed position, and it frequently leaves the water to settle on the surface of fuci exposed to the atmosphere."

This species in one form or other, is universally distributed around the British Islands, living on Laminariæ just below low-water mark, and often cast up dead upon sandy shores. It ranges all round the boreal regions of the North Atlantic.

L. CRASSIOR, Montagu.

Ovate-conoid, strong, never banded; pillar not canaliculated.

Plate LXXII. fig. 5, 6.

Turbo crassior, MONT. Test. Brit. vol. ii. p. 309; Suppl. p. 127, pl. 20, f. 1.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 159.—TURT. Conch. Diction. p. 198.—FLEMING, Brit. Animals, p. 299.—Brit. Marine Conch. p. 167.—DILLW. Recent Shells, vol. ii. p. 820.—WOOD, Index Testaceolog. pl. 30, f. 12.

" *pallidus*, DONOV. Brit. Shells, vol. v. pl. 178, f. 4.

Lacuna crassior, TURT. Zoolog. Journ. vol. iii. p. 192—JOHNSTON, Berwick. Club, vol. i. p. 271.—HANL. Brit. Marine Conch. p. xxxix.—BROWN, Illust. Conch. G. B. p. 10, pl. 10, f. 43.

This anomalous *Lacuna* is strong, nearly opaque, has an ovate conoid shape, is covered with a rather thick dull yellowish epidermis, that is disposed in obliquely longitudinal flakes, beneath which the shell is almost smooth, a little glossy, and of a cream or pale pinkish hue. The five volutions, whose longitudinal increase is rather quick, terminate in a small depressed and not particularly pointed apex; their line of division is simple, but the whorls (except the apical ones which are simply rounded) appear peculiarly distinct and bluntly scalariform, owing to a brief horizontal compression at their upper suture; otherwise they are moderately convex. The body, which is not particularly rounded, occupies dorsally from one half to three-fifths of the length of the shell; the commencement of the basal declination, which is abrupt and subretuse, is somewhat angular. The breadth of the penult whorl is nearly twice its length. The aperture is of an uniform chalky white, is suborbicular or rounded ovate, longer than broad, and occupies from two-fifths to nearly one half the length of the shell; it is sometimes a little prominent, and often subangular, and a little effuse at the anterior extremity. The outer lip is simple and acute. The pillar-lip is broad and flattened, increases in width anteriorly, and shelves considerably inwards; it is neither particularly oblique, nor canaliculated, but at most is indented with an obscure and narrow groove-like chink; the free edge is concave. The axis is imperforate. The average length is only five lines, and the breadth three; but these dimensions are often exceeded.

Unfortunately we do not possess any note of the animal of this, perhaps the scarcest of our *Lacunæ*, though common enough in many localities, especially in the North. It has the widest vertical range of any of our species, extending from low-water-mark to as deep as fifty fathoms (Thomas). Like the last species it is a favourite food of the haddock (Knapp). Mr. A. Hancock has found it alive at Cullercoats in pools at low water.

Note.—We have not seen the *L. retusa* of Brown (Ill. Conch. G. B. p. 128, pl. 10, f. 52, 53), the delineation of which somewhat reminds one of the fry of *Paludina*, but copy his description *verbatim*;

"Very thin, subglobose, hyaline, and of a greenish-brown colour; spire extremely small, hardly elevated above the body, and consisting of two volutions;

body with a subcarinated zone in the centre; aperture obliquely ovate; outer lip thin and sharp at the edge; pillar-lip narrowly reflected, with a slight slit behind. Found at Dunbar by General Bingham."

We doubt the maturity of this shell.

The *Nerita pellucida* and *alba* of Adams (Trans. Linn. Soc. vol. iii. p. 67, copied in vol. viii. p. 227, and in Turt. Conch. Diction. p. 127, &c.) are possibly the fry of *Lacunæ*, but their description is by far too meagre for identification.

ASSIMINIA. Leach, Gray.

Shell ovato-conical, solid, with a more or less produced spire, smooth or obscurely striated; mouth ovate, peritreme entire, outer lip sharp-edged, columellar lip appressed. Operculum corneous, ovate, of a few rapidly increasing whorls.

Animal having a muzzle-shaped head, with two rather short tentacula, bearing the eyes on their tips; no neck-lobes; operculigerous lobe without filamentary processes. Foot rounded at both ends. Lateral elements of the tongue (as described by Lovèn) dissimilar; all with denticulated incurved apices; median denticle with extended lateral crura and a prominent basal process.

This curious genus is remarkable among its tribe for the position of the eyes at the end of the tentacles. The question has been discussed, whether these tentacles are to be regarded as *sustentacula* only, or as *vibracula* and *sustentacula* united. The latter view, which has been maintained by Mr. Gray, seems to us that which most nearly approaches the truth.

The *Assiminia* are mostly inhabitants of brackish water. Species have been discovered in many parts of both the old and new worlds, and many, owing to the difficulty of determining them without a knowledge of the animal, have probably been overlooked.

A. GRAYANA, Jeffreys.

Plate LXXI, fig. 3, 4 and (Animal) Plate H. II. fig. 6.

Nerita Syncera hepatica, GRAY, Medical Repository, vol. xv. (1821) p. 239, (animal).

Limneus Grayanus, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 378.

Assiminia Grayana, FLEMING, Brit. Animals, p. 275.—BERKELEY, Zoolog. Jour. vol. v. p. 429, (animal), pl. 19, f. 4. — GRAY, Manual L. and F. W. Shells, p. 86, pl. 11, f. 127. — BROWN, Illust. Conch. G. B. p. 27, pl. 18, f. 3, 4. — SOWERBY, Conch. Manual, f. 363*.

Paludina ,, POTIEZ and MICH. Gal. Douai, Mollusq. vol. i. p. 251, pl. 25, f. 23, 24.

It seems surprising that a shell so locally abundant as this is should not have been noticed by the earlier writers upon British Conchology. It is of an oval-conic shape, but occasionally becomes both broader and more abbreviated, is tolerably strong, a little translucent, smooth or very nearly so, and of a shining fulvous tint. This colouring is either uniform, or so arranged that whilst the space around the axis is of a paler tint than the rest, a broad central band of a more intense hue encircles the body, and is continued as a narrow strip along the bottom of the smaller volutions. Nearly one half of the length occupied by the seven whorls, of which the shell is composed, is filled by the body whorl (when viewed from above); the rest of the volutions are plano-convex or but very little rounded, simply and regularly shelving, and rather short, their height not being equal to half their breadth. A slight degree of angularity is generally perceptible about the middle of the body-whorl, nearly in a line with the course of the suture: the base is short, and the slope is a little convex. The spire is rather quickly attenuated, and the apex is very small, and rather acute. The sutural line is simple, but distinct, and scarcely at all slanting. The aperture is rather small, occupies about three-eighths of the total length of the shell, and rather more than half the basal diameter ; its shape is ovate-acute, the posterior end being a little contracted. The edge of the outer lip, which is continuously arched, and rather prominent, is a little flattened anteriorly. There is no umbilicus, but only a slight indentation behind the pillar-lip, which latter is somewhat expanded, appressed, rather short, curved, yet not so much as the outer one, and is spread into a callosity posteriorly. A line and three quarters for the breadth, and not quite three lines for the length, may be regarded as the average dimensions of full-sized individuals ; the breadth is oftentimes, however, rather more in proportion.

The animal was carefully examined by the Rev. M. J. Berkeley, and described and figured by him in the fifth volume of the "Zoological Journal." The muzzle is deeply notched in front, fuscous, strongly annulated, and has pale edges to its lip ; on each side is a groove running backwards from the base of the tentacula. These organs are very short, obtuse, and fuscous, and bear the eyes on their tips. The foot is broadly obovate, obtuse, above fuscous, beneath olivaceous, shaded with cinereous ; its front margin is double.

It inhabits brackish water "amongst *Confervæ*, *Ruppia*, *Zanichellia*, &c.," in the estuaries of rivers in the south-east of England. Greenwich marshes.

RISSOA. Frèminville.

Shell conical, solid or thin, with a produced spire; surface smooth or ribbed, spirally or longitudinally striated and grooved, in some species cancellated; colour various; mouth ovate, peritreme entire, continuous, outer lip sharp-edged or strengthened by a rib. Operculum ovate, corneous, of a few rapidly increasing whorls.

Animal having a produced muzzle-shaped head, with two long setaceous tentacula bearing eyes or bulgings near their external bases. No neck-lobes; operculigerous lobes with developed lateral expansions, and in numerous species with a caudal filament. Foot usually sub-angulated in front, acute behind; in some species rounded at both ends. Lateral elements of the tongue dissimilar, all with denticulated apices; medium denticle, and its flanking laterals very broad, and with lobed incurved apices.

Almost all the shells which compose this extensive genus are of very small size. They inhabit all depths of water between high-tide-mark, and one hundred fathoms, but the majority of them are dwellers in the laminarian zone. Many are remarkable for beauty of sculpture, others for brilliancy of colour. They are found in all parts of the world, but abound most in the southern parts of the north temperate zone. Several attempts have been made to divide the *Rissoæ* under different genera, but, after a careful consideration of their shells, and of the animals as far as known, and not without hesitation we have felt obliged to keep them together, and even to include those curious brackish water forms which have been styled, among other names, Paludinellæ. Should, however, the latter be found to have the posterior part of the foot always rounded, and the operculigerous lobe constantly destitute of a caudal filament; and, on the other hand, the truly marine species to have the caudal termination constantly acute, and the operculigerous lobe always provided with a cirrhus, then we may have sufficient grounds for separating the two groups. At present, however, we cannot assert such differences in the animals to be constant, and, as to the shells, a generic distinction founded on them will not in this instance hold good, since assuredly the latter characters of the animal in known instances accompany forms of shells, which, though truly marine, cannot be definitely distinguished from the *Paludinellæ*.

The *Rissoæ* undoubtedly existed during the oolitic period; brackish water species of the genus are abundant in the Purbeck rocks; so similar, too, are they to existing forms, that it requires a very critical eye to mark their differences.

R. STRIATULA, Montagu.

Short, strong; whorls encircled by acute prominent carinæ, whose interstices are traversed by densely-disposed minute longitudinal striæ.

Plate LXXIX. fig. 7, 8.

Turbo carinatus, DA COSTA, Brit. Conch. p. 102, pl. 8, f. 10.
Turbo striatulus, (not of Linn.)—MONT. Test. Brit. vol. ii. p. 306, pl. 10, f. 5.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 172 (not diagnosis). — RACK. Dorset Catalog. p. 50, pl. 14, f. 10. — TURT. Conch. Dict. p. 212. — DILLW. Recent Shells, vol. ii. p. 857.—WOOD, Index Testac. pl. 31, f. 100.
„ *monilis*, TURT. Conch. Diction. p. 200 (fide Jeffreys from type).
Cingula striatula, FLEMING, Brit. Animals, p. 305.—Brit. Marine Conch. p. 175, f. 45.
Rissoa „ RECLUZ, Revue Zoolog. Cuvier. 1843, p. 9.
Littorina „ BROWN, Illust. Conch. G. B. p. 17, pl. 10, f. 33, 34.

Although assuredly not the *Turbo striatulus* of Linnæus, which we regard as a lost species, since the types are no longer to be found, and the description is too brief for recognition, we retain the specific epithet by which the shell is so generally known, since Montagu has clearly defined and well figured it under that appellation, whilst Da Costa, although prior, has forfeited his claim, through wilfully substituting a name of his own for what he thought the true Linnæan one.

Turton, Fleming, &c., have rightly omitted the obnoxious reference to the Systema Naturæ. Neither Michaud, nor Philippi (supposing the *trochlea* * and *labiata* † to be identical, as some assert) were aware that the species had been already described.

In general aspect this shell reminds one of the genus *Littorina.* It has an abbreviated oval-acute form, is moderately strong, particularly so for its genus, of a rather dull surface, and of an uniform squalid white both within and without ; dead specimens, however, are as white as snow. The five volutions that compose the spire occupy about three-sevenths of the dorsal length, and are divided by a simple but distinct suture ; the apex, more frequently blunted by attrition, is rather pointed in the more perfect examples. The lower whorls are scalariform, being horizontally flattened above, and almost perpendicularly straight below. The turns of the spire rather quickly increase in size, yet are rather short, for even in the penult the breadth rather exceeds twice the length, whilst in the antepenult the proportion is nearly as three to one. The body is moderately attenuated below; the basal declination is convex and not at all sudden.

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* *R. trochlea*, MICH. N. Esp. Riss. p. 16, f. 3, 4.—POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 267.

† *R. labiata*, PHIL. Moll. Sicil. vol. i. p. 155, pl. 10, f. 7 (fossil).—DESH. Lam Anim. s. Vert. vol. viii. p. 467.

The spiral carinæ, with the densely disposed perpendicular lamellar striæ, in their intervals, constitute the peculiar feature of this species. The two principal keels are sharp and prominent, particularly the upper one, which generally curls a little upward and is not adjacent to the suture, but lies about as far from it as from the second carina. These two are followed on the body-whorl, at some little distance, by numerous crowded spiral costæ, the terminal ones of which are rather further apart; one of these ribs is generally apparent, also, along with the carinæ, on some of the smaller volutions. Occasionally a raised line or two winds between the principal keels. The aperture is large, and occupies about four-sevenths of the total length, and about three-sevenths of the ventral area; its contour is rather obliquely subovate, rounded below, but contracted above. The outer lip is prominently marginated or thickened behind, straightish or but little curved in the middle, and well arcuated anteriorly; its basal recession is very trifling. The throat merely exhibits the indentations of the external sculpture. The inner lip, which unites itself to the outer one by a broad parietal enamel, is very narrow on the columella, where its inner edge is comparatively rectilinear. There is no umbilical chink. Our largest specimens measure nearly a quarter of an inch in length, and fully two lines in breadth.

The animal of this, as of too many other *Rissoæ*, is, as yet, unknown.

This is a southern species and scarce; Island of Herm on rocks near low-water-mark (S. H.); Margate (S. H.); gathered in sand from Cornwall by Mrs. Richard Smith, and at Exmouth by Mr. Clark (Jeffreys); Tenby (Lyons); in seven fathoms, Weymouth (E. F.); Bantry Bay (Jeffreys); Arran Isles, Galway (Barlee); in several localities in the south and west of Ireland (Thompson). It ranges southwards to the Mediterranean.

R. LACTEA, Michaud.

Suboval, girt with elevated striæ, that are decussated, except in general upon the base of the body-whorl, by longitudinal costellæ or raised lines : spire short : suture simple : throat smooth.

Plate LXXIX. fig. 3, 4.

Turbo cancellatus, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 218, fide Recluz, (irrecognizable).—DELESSERT, Rec. Coq. Lam. pl. 37, f. 7.

Rissoa lactea, MICHAUD, Espèces de Riss. p. 9, fig. 11, 12.—PHILIPPI, Moll. Sicil. vol. i. p. 159 ; vol. ii. p. 129.—POTIEZ and MICH. Galerie Douai, Moll. vol. i. p. 271.—DESH. Lam. Anim. s. Vert. vol. viii. p. 466.

„ *cancellata*, RECLUZ, Rev. Zool. Cuvier. 1843, p. 8.

Both this and the preceding species belong to the Littoriniform types of the genus. The shell is tolerably strong, but little if at all translucent, of a dull and uniform squalid white (in fresh examples), and of an oval-acute contour. The surface is elegantly sculptured by a peculiar decussation of raised spiral and perpendicular lines. The former are the more apparent upon the body, where they appear as rather crowded revolving costellæ, that become rather more distant as they approach the anterior extremity : upon the lesser turns they are mere lamellar arcuated striæ, and are much more densely disposed (we counted six or seven on the penult) than the longitudinal ones. The latter are the more marked upon the spire, where they appear as subpliciform lamellæ ; they do not quite extend to the base of the shell, are moderately distant from each other, but approximate as they approach the outer lip. The suture is rendered very distinct by the contrast between the shelving of the upper part of the volutions, and the more sudden slope of the lower portion; moreover, the whorls, especially the last, are apt to become subscalariform, subangulately jutting out a little from the base of the preceding turn. The longitudinal increase of the lower whorls of the spire, which scarcely occupies more than a third of the total length, and is composed of five more or less rounded coils, is rather quick; the turns themselves are short, except the penult, whose breadth does not much exceed twice its length. The apex is more or less acute. The body, which is simply convex above, is rather produced and a little attenuated below; its basal declination is neither flattened nor abrupt.

The aperture, which is quite as long as the remainder of the shell, is oval-subpyriform, devoid of sculpture, contracted and slightly subsinuated above, rounded and a little patulous below. The throat is smooth, and the lips continuous; the outer one is acute, straightish above, yet well arcuated below; a linear indentation, but no distinct umbilical chink, is for the most part visible behind the straightish pillar.

Of this beautiful species, four living specimens (two of which were unfortunately lost) were taken by Mr. Hanley, from under large masses of stone at St. Helier's, in Jersey, by wading into pools at very low water. The larger examples were nearly a quarter of an inch long, and almost two lines broad.

It is a South-European form, ranging through the Mediterranean, where it lives immediately below the edge of the sea, and dead shells are abundantly thrown ashore on the sand.

R. Zetlandica, Montagu.

More or less oval-acute; whorls scalariform, cancellated by longitudinal and spiral costellæ, of which latter there are three on the penult, and five or six only on the last whorl: a smooth broad concave area encircles the base: throat not crenated.

Plate LXXX. fig. 1, 2.

Turbo Zetlandicus, Mont. Trans. Linn. Soc. vol. xi. (1811) p. 194, pl. 13, f. 3.—Turt. Conch. Diction. p. 211.
Cyclostrema Zetlandica, Fleming, Brit. Anim. p. 312. — Brit. Marine Conch. p. 158.
Rissoa cyclostomata, Recluz, Rev. Zoolog. Cuvier. 1843, p. 104.
Cingula scalariformis, Brit. Marine Conch. p. xlii. fig. 89.
Rissoa Zetlandica, Brown, Illust. Conch. G. B. p. 11, pl. 9, f. 79.

The original representation of this shell in the Linnean Transactions, is so unlike its ordinary shape, that the identity of *scalariformis* would scarcely be surmised from a comparison of its figure in the "British Marine Conchology."

The form varies in some degree as to elongation or abbreviation, but is generally oval-acute, and the shell is moderately strong, not translucent, and of an almost uniform squalid white, or pale fulvous. The four larger volutions are roughened by moderately distant longitudinal ribs, that are more or less distinctly clathrated by spiral costellæ, of which last there are generally three rows on the penult and antepenult turns, and five, besides the extreme basal one, on the body-whorl. The longitudinal ribs, attenuated to lamellæ, are continued over the horizontally flattened summit of each volution, but often cease below after the fourth spiral ridge, and are always absent from the broad concave area that lies between the peculiarly prominent fifth ridge, (often of an intensely fulvous hue,) and the slight anterior or terminal keel. Sometimes the spiral sculpture is comparatively obscure, so as to be chiefly perceptible through intersectional asperities upon the perpendicular ribs. There are six and a half abruptly scalariform volutions, that are so deeply divided by the profound yet simple suture, towards which they suddenly and subangulately shelve both above and below (the middle portion being moderately convex), as almost to appear disunited. The length of the body is about equal to that of the spire, and the length of the penult to that of the two previous turns united; the apex is exceedingly small in proportion to the next two equally smooth volutions. The mouth occupies from about two-fifths to nearly three-sevenths of the entire length, and is oval or rounded oval, and not crenated internally. The outer lip is solid, arcuated, prominent, and thickened behind by a sharply-projecting but not very wide rib; it is curiously edged with two erect lines, enclosing a very narrow and flatly excavated space between them, the inner one of which passes over the pillar-lip, and completes the circuit of the aperture. Our largest specimens were only a line broad, and scarcely two in length.

We have never seen it alive.

Though designated after our northernmost province, this species really occurs at both ends of the British seas, but is scarce and local. Herm (S. H.); Guernsey (Barlee); Exmouth, where it was gathered by Mr. H. Gwyn; in Barrycane, North Devon, collected by Miss Jeffreys (Jeffreys). In thirty-five and seventy fathoms on the west coast of Zetland (M'Andrew and E. F.); Lerwick (Jeffreys and Barlee); Eda Sound, and in from twenty to fifty fathoms on the east, and forty to sixty fathoms on the west coast of Orkney (Thomas).

It ranges to the coasts of Sweden (Lovén), and is found fossil in the coralline crag of Sutton (Searles Wood).

There is not the slightest ground for regarding this species as the type of a genus distinct from *Rissoa*.

R. CRENULATA, Michaud.

Oval-acute, solid, coarsely cancellated by longitudinal and spiral costellæ, of which latter there are not more than three rows on the penult whorl; throat crenated.

Plate LXXIX. fig. 1, 2.

Turbo cancellatus, DA COSTA, Brit. Conch. p. 104, pl. 8, f. 6, 9.
„ *cimex*, (not Linn.) DONOVAN, Brit. Shells, vol. i. pl. 2, f. 1.—MONT. Test. Brit. vol. ii. p. 315. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 161. — RACK. Dorset Catalog. p. 49, pl. 14, f. 6, 9.— TURT. Conch. Diction. p. 210. — DILLW. Recent Shells, vol. ii. p. 821.—WOOD, Index Testaceolog. pl. 30, f. 15.
Cingula „ FLEMING, British Animals, p. 305.—Brit. Marine Conch. p. 174.
Rissoa crenulata, MICHAUD, Nouv. Espèces de Riss. p. 15, f. 1, 2. — POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 269. — DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 465. — PHILIPPI, Moll. Sicil. vol. ii. p. 126.
„ *cimex*, BROWN. Illust. Conch. G. B. p. 11, pl. 8, f. 21, 22.

As the name given by Da Costa, in one of his many ungenerous attempts to deprive Linnæus of the honour of nomenclature, was bestowed by him on a shell which he erroneously believed had already received a prior appellation, it cannot take precedence of the subsequent one by Michaud.

This well known *Rissoa*, perhaps one of the most diffused species of its genus, has an ovate acute figure, is strong, yet a little translucent, and is of an uniform yellowish white, or merely with a subsutural zone of fulvous, and another near the basal extremity of the shell. The exterior is coarsely cancellated throughout by equal-sized and nearly equidistant spiral and longitudinal ridges, so that the interstitial hollows are nearly square, or somewhat broader than long. The spiral series on the body-whorl are six or seven in number; of these two or three are continued to the penult volution, and for the most part two are likewise perceptible upon both the preceding turns. The points of intersection, in living examples, owing to the sharpness of the ridges in their perfect condition, are acute. The body occupies from one half to four-sevenths of the total length of the shell; its surface is moderately convex, and its basal declination rounded and gradual. The spire is composed of four or five short turns, of which the penult very nearly equals the united length of the three previous ones; they are prominent, but not truly convex, and from their scalariform structure, the profound suture appears at times to be almost canaliculated. The mouth, which is either nearly ovate or of a rounded oval figure, occupies nearly one half of the entire length, but its cavity is visibly diminished by the thickness of the outer lip, which latter is moderately curved and externally marginated and dentated by the projecting terminations of the spiral ridges. The inner lip is often stained, in living examples, with rufous chocolate; with this hue the throat, which is crenated by raised sulci, is also faintly tinged. The pillar itself is arcuated, spread, and furnished with a tubercular elevation. Our largest specimen measures nearly a quarter of an inch in length, and more than the eighth of an inch in breadth.

The beach in a miniature bay of the little islet of Herm, near Guernsey, is literally composed of myriads of dead shells of this species; yet during a residence of some weeks not a single individual was discovered in a living state; the vast accumulations being in all probability derived from the numerous submerged rocks which stud the waters that lie between this nook and the adjacent island (S. H.). We have dredged it, dead, in fifteen fathoms in west bay of Portland and on the south coast of Cornwall (M'Andrew and E. F.); Falmouth; White-sand bay, Cornwall; Manorbeer, Pembrokeshire (Jeffreys); Torquay (S. H.), off Lundy Island, and in fifty fathoms on the Nymph bank, but dead (M'Andrew); "Guernsey, Salcombe bay, Skye, Stornoway, Loch Fyne, Bantry, Birterbuy Bay, and Arran Isles in Galway" (Barlee). "Found in a few places on the east, west, and south coasts of Ireland" (W. Thompson). The preceding localities will show that it is mainly a southern and western species. It does not range north of Britain, though southwards extending throughout the Lusitanian and Mediterranean regions.

R. calathus, Forbes and Hanley.

Oblong-conic, finely cancellated throughout by longitudinal and spiral costellar striæ, of which latter there are four or five rows on the penult volution. Whorls six, prominently rounded; the last but one rather elongated and swollen; the last narrow. Throat crenated.

Plate LXXVIII. fig. 3.

This shell is generally named "*calathiscus?*" in British collections; not that it agrees correctly with the figure in Montagu's "Testacea," but that it approaches his description more nearly than any well-authenticated indigenous species. We have changed the name but slightly, so as to facilitate the recognition and memory of the shell we are about to describe.

This pretty little shell has an oblong-acute figure, is not very strong, and is slightly translucent; its surface has some little lustre, and is of a yellowish white, either uniform in tint, or with a faintly indicated zone of fulvous at the top, and near the base, of the body. Of the six volutions, the body or final one is rather less than the united length of the rest; and of about equal length and breadth; the penult is rounded, swollen at its base, rather large in proportion to all the other turns, and about twice as broad as it is long; the rest are convex, but shelve to a greater extent above. The body compared to that of *crenulata* is very narrow; its basal declination is uninterruptedly rounded and gradual. The suture is profound, or even excavated. The sculpture, which extends to the anterior extremity, consists of a fine but regular cancellation effected by the intersection at right angles of moderately raised perpendicular and spiral costellæ; the lattices are broader than long, the perpendicular riblets being the more distant. There are four or five rows of the spiral raised lines on the penult, and about eight or nine on the body, on which last they are not undulated, nor are the longitudinal ones at all crowded. The aperture is small, rounded ovate, and occupies about two-fifths of the entire length. The arcuated outer lip is marginated or thickened behind, is solid, dentated outside by the termination of the spiral riblets, and distinctly crenated internally; it projects but little, and is not patulous anteriorly. The pillar is pure white, not tuberculated, and the inner lip is not much developed. The usual length is the eighth of an inch, and the breadth nearly four-fifths of a line. Mr. Barlee possesses a very coarsely cancellated example, with but seven rows of spiral costellæ on the body, and three or four only on the penult whorl. The usual length is the eighth of an inch, and the breadth about three-quarters of a line.

This *Rissoa* is a scarce species, and apparently confined to the south of Great Britain and west of Ireland. Herm (S. H.); Shellness, Kent; Whitesand Bay (Jeffreys); in from fifteen to twenty fathoms off Penzance (M'Andrew and E. F.); in fifty fathoms, dead, off Mizen Head (M'Andrew); "collected by Mr. Warren, at Kilkee, in Clare, Ireland" (W. Thompson).

It probably ranges along all the south-western coast of Europe, and was one of the *Rissoæ* dredged by Mr. M'Andrew at Vigo in Spain.

R. Beanii, Hanley.

Oblong-conic, strong, wholly or partially decussated or subcancellated by longitudinal and spiral raised lines, of which last there are six rows on the penult volution. Apex rather acute: penult whorl not particularly swollen. Suture excavated. Mouth subovate, rather small: throat crenated.

Plate LXXIX. fig. 5, 6.

Cingula Beanii, Hanley, Brit. Marine Conch. p. xli. fig. 43.
Rissoa „ Lovèn, Index Moll. Scandinav. p. 24 (from specimens).

This shell has an oblong conic shape, is rather solid, scarcely if at all translucent, and of a somewhat dull surface; it is either of an uniform fulvous or rufo-fulvous brown, or is yellowish white with a tawny zone near the suture and base of the body-whorl, and a stain of rich brown upon the inner lip. There are two principal variations as to sculpture, which arise from the degree and extent of the characteristic decussation. In those rather narrow individuals from which the species was originally constituted, the body is merely ridged in a spiral direction with closely disposed strong spiral flat-topped costellæ, which are decussated above only by perpendicular riblets, or else are broken posteriorly into longitudinal series of tubercles that do not extend to the base of the shell. In the broader and subcancellated variety, the body, as well as the smaller turns, is more or less closely traversed throughout by longitudinal folds, that are surmounted and subtuberculated by the spiral costellæ, so as to form a more or less crowded decussation. The number of spiral lines on the penult whorl is almost invariably six; on the body there are generally twice that number underneath, of which only eight or nine are visible on the dorsal surface. The spire, which is about equal in length to the body, and terminates in a rather small point, is composed of five or five and a-half volutions, that are divided by an excavated suture, somewhat quickly increase in length, and are either rounded or merely convex. The body is rather narrow for a species of this section of *Rissoa*, and its basal declination is rounded and gradual; the penult whorl is sometimes rather large in proportion to the rest. The mouth occupies from two-fifths to nearly three-sevenths of the entire length, is rather small, not patulous, of a nearly ovate shape, and has its throat more or less distinctly crenated by raised sulci. The outer lip is thickened behind, and much rounded at the base. The ordinary length is two lines, and the breadth one line.

Certain individuals of the sub-cancellated variety of this shell bear so striking a resemblance to *calathus*, as to suggest doubts of their specific individuality, but may usually be distinguished with readiness by the smaller size of their lattice-work.

As *Zetlandica* seems to replace *crenulata* northwards, though both species are companions during a portion of their range, so is the distribution of *Beanii*, as compared with that of *calathus*.

Exmouth; Plymouth; collected by Mrs. Richard Smith in sand from Cornwall (Jeffreys); in from fifteen to twenty fathoms, Caernarvon Bay (M'Andrew); Oban; Loch Carron and adjacent coast; Lerwick and Deal Voe, Zetland (Jeffreys); in fifteen fathoms, Eda Sound, and in seven fathoms, Sanda Sound, Orkney, among corallines and broken shells; also in fifty fathoms between Fair Island and Orkney (Thomas). Dublin Bay (Alder); among nullipores in Bantry Bay (Thompson); Birterbuy Bay, in Galway (Jeffreys).

It ranges to the coast of Sweden (Lovén).

R. abyssicola, Forbes.

Elongated oval-conic, thin, white, very closely decussated by wavy spiral, and longitudinal lamellar lyræ, the latter of which are the more prominent. Whorls not peculiarly rounded; spire as long as the body, blunt at the apex: suture profound: mouth roundish: throat smooth.

Plate LXXVIII. fig. 1, 2, and (animal) Plate J. J. fig. 3.

This pretty species was first announced at the meeting of the British Association at Cambridge in 1845. It has an elongated oval-acute figure, is not very strong, is of an uniform semitransparent white, and often a little glossy. The sculpture reminds us of that of *lactea*, and consists of close well-marked and very numerous longitudinal lamellar ribs, which do not extend to the base of the body, and still more densely disposed spiral costellæ; the former are often oblique, the latter almost always undulated. The spire, which is, if anything, rather longer than the body, consists of quite four volutions, that are divided by a canaliculated or excavated suture, and end in an obtuse apex. These turns are well rounded, yet shelving: their longitudinal increase is rather quick, especially that of the penult, which is somewhat large in proportion to the rest, its length being nearly its breadth. The body is well rounded, and not produced; its basal declination is convex, and moderate. The aperture is suborbicular or rounded-ovate, occupies about two-fifths or rather more of the total length, and is not distinguished by any peculiar sculpture. The throat is smooth; the lips continuous, and both of them considerably and nearly equally arched. The outer one is thickened behind, and although not patulous, juts out very distinctly (instead of receding, as in certain shells) at the anterior extremity; the inner one is narrow, and is not followed by any umbilical chink. The pillar is much curved. The average length of examples is only the tenth of an inch, with an extreme breadth of scarcely three-quarters of a line.

Although one of the rarest and most recently discovered of our *Rissoæ*, we have been so fortunate as to meet with and examine the animal. It has a short and rather narrow muzzle; the tentacles are long and linear; the eyes large for the size of the creature, black, and placed on rather more prominent bulgings than usual. The foot is capable of great elongation in front, where it is angulated and marginated, behind it is pointed; immediately behind the operculum is a single, rather short, but conspicuous cirrhus. The entire animal, except the eyes, is of a milky white.

It was first dredged alive in one hundred fathoms, on a muddy bottom in Loch Fyne (M'Andrew and E. F.); Mr. Jeffreys and Mr. Barlee have taken it off Croulin Island on the coast of Skye. Mr. M'Andrew has also dredged it in sixty fathoms, fifteen miles to the S. W. of Mizen Head. It is probably a member of our boreal fauna.

R. SCULPTA, Philippi.

Oval-conic, bluntly nodulous where the spiral lyræ intersect the longitudinal folds, which latter do not usually extend to the extreme base; five spiral rows of nodules on the penult turn. Body whorl broad and short; volutions prominent, subscalariform; the lesser ones excavated at their bases, so as to present a widely channelled suture: apex acute. Mouth suborbicular, moderately large: throat with rudimentary crenæ, that are occasionally almost obsolete.

Plate LXXX. fig. 5, 6.

Rissoa sculpta, PHILIPPI, Moll. Sicil. vol. ii. p. 131, pl. 23, f. 21 (fossil).

Although the aperture is described by Philippi as perfectly smooth, we cannot doubt, from the rest of his language, that his fossil species is identical with our recent British shell, especially as the crenæ or rudimentary raised sulci of the throat are often scarcely perceptible.

This species closely resembles both *calathus* and *Beanii* as to the general aspect of its sculpture, but differs from both of them in the greater breadth of its body, which affects the general shape, and the more scalariform structure of its whorls.

We propose, for brevity's sake, to particularize certain points only of its characteristics, as our description of the subcancellated variety of *Beanii* will apply to it in all other respects. We have never seen banded examples, but only such as are of an uniform fulvous, tawny orange, or pure white: there are occasionally, however, two rufous stains near the outer lip; the inner lip does not appear tinged with any colouring matter. The foldlike riblets are surmounted at the intersection of the spiral costellæ by blunt oval nodules; the decussated sculpture is more closely disposed, there being ten spiral rows on the body of which the three or four lower ones are often simple; and five rows upon the preceding turn. The shell is scarcely so solid as in the last, and is generally a little translucent and glossy. The spire is for the most part slightly longer than the body, and is composed of six ventricose whorls, which appear very prominent and somewhat scalar from the great abruptness of the broadly excavated suture. The body is short, rounded, and broad; its basal declination is curved and rather sudden. The mouth is larger and more rounded than in *Beanii;* the external pad of the arcuated outer lip, whose internal crenæ are sometimes almost obsolete, is abrupt. Strictly speaking, it is not the suture that is excavated but the base of the preceding whorl. The first three turns are perfectly smooth.

Dredged by Mr. M'Andrew, Mr. Jeffreys, and Mr. Barlee, on the west coast of Scotland. Zetland (Barlee). Possibly some of our localities for *Beanii* may belong to this species. Lovén records it as a Swedish species.

R. PUNCTURA, Montagu.

Oval-conic, more or less coloured, very finely cancellated by many spiral, and very numerous longitudinal thread-like lines: whorls peculiarly rounded: suture profound, but not excavated: throat perfectly smooth.

Plate LXXX. fig. 8, 9.

Turbo reticulatus, ADAMS, Trans. Linn. Soc. vol. iii. p. 66, pl. 13, f. 19, 21?—MONT. Test. Brit. vol. ii. p. 322; Suppl. pl. 21, f. 1.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 172.—TURT. Conch. Diction. p. 212.—DILLW. Recent Shells, vol. ii. p. 858.—WOOD, Index Testaceolog. pl. 31, f. 101.

„ *punctura*, MONT. Test. Brit. vol. ii. p. 320, pl. 12, f. 5.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 214.—TURT. Conch. Diction. p. 211.—DILLW. Recent Shells, vol. ii. p. 838.—WOOD, Index Testaceol. pl. 31, f. 53.

Cingula reticulata, FLEMING, Brit. Animals, p. 306.—Brit. Marine Conch. p. xl.

Rissoa „ JOHNSTON, Berwick. Club, vol. i. p. 272.—BROWN, Illust. Conch. G. B. p. 12, pl. 9, f. 30.

„ *puncturata*, MACGILLIV. Moll. Aberd. p. 327.

Cingula punctura, Brit. Marine Conch. p. xliii.

Rissoa punctura, BROWN, Illust. Conch. G. B. pl. 9, f. 43.
„ *approxima*, BROWN, Illust. Conch. G. B. p. 12, pl. 9, f. 42 ?

We consider the *Turbo punctura* and *reticulatus* of Montagu to be merely two conditions of the same shell, the outer lip in the former not being marginated at that stage of growth. We have preferred the appellation *punctura*, not on account of its two pages of priority (since the actual date of publication was the same for both), but because the description of the latter was not sufficiently perspicuous to enable naturalists to identify the object intended; hence *Beanii*, *inconspicua*, &c. are often queried for that shell in the cabinets of our most scientific collectors. Neither the pen nor the pencil of Adams have clearly defined the species he meant to pourtray.

The shell is rather thin, translucent, more or less glossy, and of a conic or oval-conic form. In general it is of an uniform yellowish white, but when perfectly fresh is girt towards the base of the body with a tawny narrow zone, from whence, as well as from the suture, emanate rather distant streaks of the same hue, that do not usually touch each other in the middle of the whorl. A coloured spot, marking the termination of the zone, is almost always perceptible near the base of the outer lip, behind which, near the top, may usually be seen, likewise, an oblique coloured segment of a circle. The surface is reticulated or very delicately cancellated by longitudinal and spiral thread-like lines, which are so slightly raised that worn individuals appear to be merely indented with regular and closely disposed series of punctures. The longitudinal threads are extremely numerous, and usually become more or less indistinct near the base of the body; the spiral ones, which extend to the extreme base, are also numerous, there being generally twelve or fourteen of them upon the body, and about five on the penult. There are six remarkably rounded volutions, which rather quickly attenuate to a small but not very acute apical point, and are divided from each other by a very profound but narrow suture. The body is of nearly equal length with the spire; its basal declination is rapid but well arcuated. The aperture is rather large than otherwise, and occupies from two-fifths to nearly three-sevenths of the total length of the shell; it is of a rounded oval or suborbicular shape, and is quite smooth at the throat. The outer lip is much arcuated, broadly rounded at the base of the shell, and but little marginated. There is a distinct but narrow pillar lip (oftentimes stained with rufous or liver colour) which being a little reflected and raised slightly at its curved outer margin, displays a kind of umbilical crevice behind it. This minute shell is hardly the tenth of an inch long, but rather more than half that measurement in breadth.

This species seems to range, though scarce in most places, throughout the British seas. Plymouth, Whitesand Bay, Sandwich, Caswell Bay near Swansea (Jeffreys); Exmouth (Clark); general in Devonshire (S. H.): Scarborough (Bean); Isle of Man in twenty fathoms (E. F.). "On corallines from ten to twenty fathoms water, and in shell sand," frequent in Northumberland (Alder); Berwick (Johnston); Aberdeenshire (M'Gillivray); along with *calathus* in Orkney (Thomas); Lerwick, Zetland; Hebrides (Jeffreys); Bundoran and Kilkee on the west coast of Ireland (W. Thompson) Bantry Bay; Dublin Bay (Jeffreys).

There is so much confusion in the determinations of this species and its allies, that we only give such localities as have been rightly determined, and cannot venture on foreign distribution.

R. COSTATA, Adams.

Oblong-turreted, white; whorls with strong longitudinal ribs: base with a spiral carina: lip marginated; throat smooth.

Plate LXXVIII. fig. 6, 7.

Turbo costatus, ADAMS, Trans. Linn. Soc. vol. iii. pl. 13, f. 13, 14 (probably).—MONT. Test. Brit. vol. ii. p. 311, pl. 10, f. 6. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 174. — RACK. Dorset Catalog. p. 51, pl. 19, f. 5.—TURT. Conch. Diction. p. 214.—DILLW. Recent Shells, vol. ii. p. 860.—WOOD, Index Testac. pl. 31, f. 107.

,, *plicatus*, MUHLF. Verh. Nat. Berlin. vol. i. pl. 9 (also called 3), f. 2.

Cingula costata, FLEMING, Brit. Animals, p. 305.—Brit. Marine Conch. p. 175.

Rissoa exigua, MICHAUD, Espèces de Rissoa, p. 18, f. 29, 30 (not well).—POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 269.—DESH. in Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 481.—PHILIPPI, Moll. Sicil. vol. ii. p. 125.—MENKE, Zeitsch. Malak. 1845, p. 42.

Cingula carinata, PHILIPPI, Moll. Sicil. vol. i. p. 150, pl. 10, f. 10 (not well).

Rissoa costata, JOHNSTON, Berwick. Club. vol. i. p. 273.—BROWN, Illust. Conch. G. B. p. 11, pl. 9, f. 74.

This beautiful little shell is moderately strong, a little translucent, often with a vitreous lustre, and of an oblong turreted contour. It is of an uniform white, and its surface is traversed, as well by strong distant and obliquely longitudinal ribs, as by crowded and spiral striæ. The latter, which under the microscope show themselves to be slightly elevated, are chiefly perceptible in the interstices of the costæ; the former commence at the suture, but do not extend, upon the body, to the extreme base, but are interrupted by a very prominent spiral carina, that revolves from the top of the inner-lip to the anterior corner of the outer lip, from the marginated rim of which last it is separated by a narrow and somewhat concave strip of surface. The body is scarcely, in general, so long as the spire, which is composed of five somewhat ventricose turns, that are profoundly, rather abruptly, and often subangulately divided by a slightly flexuous simple suture: the apical turn is bluntish and very small in proportion; the rest increase gradually in length, that of the penult not being equal to that of the two preceding volutions collectively. The mouth, whose cavity is vastly diminished in size by the thickness of the surrounding margin, is very obliquely subovate, perfectly smooth internally, and occupies about two-fifths only of the entire length. The outer lip, whose lateral outline is somewhat sinuous, for it advances decidedly towards the base, is very broad, being marginated behind by a rather narrow but much projecting rib. This thickened rim, whose edge is curiously marked with a shallow and flattened central excavation, that is barred across with fine raised lines, is continued also along the inner lip, and especially dilated upon the pillar; the elevated inner margin completes the circuit of the aperture. Specimens in general are only the eighth of an inch long, and not quite half so much in breadth.

This *Rissoa* is so very easily recognized, that, unlike some of those we have just been describing, its range and localities can be determined with precision. It has a range in depth from low-water-mark to as deep as twenty fathoms. It is frequent in the Channel Islands (S. H.), and along the south coast of England from Sandwich to Cornwall. We have dredged it in twenty fathoms off Penzance. It ranges along the east coast of Britain, probably becoming rather scarcer northwards, though frequent in shell sand in Northumberland (Alder). It becomes rather scarcer also as we ascend the Irish sea from the Channel, though frequent on the shores of South Wales (Jeffreys). It has been dredged in from fifteen to twenty fathoms in Caernarvon Bay (M'Andrew); and in twelve fathoms in Milford Harbour (M'Andrew and E. F.).

On the west coast of Scotland it has been taken at Oban (Jeffreys); in the Orkneys it occurs among corallines, though scarce; in fifteen fathoms, Eda Sound, and seven fathoms, Sanda Sound (Thomas). "On each side of the Irish coast" (W. Thompson); Tarbert, in Galway (Jeffreys); Clew Bay, in seven fathoms (E. F.)

Southwards it ranges to and throughout the Mediterranean, and into the Black Sea: northwards, it has been taken by Lovén on the coast of Bohuslan, Sweden. The Rev. D. Landsborough has found it fossil in raised beaches at Largs, in Ayrshire, in company with *crenulata*, *calathus* and *striatula*. These beaches must not be confounded with the *pleistocene* fossiliferous strata, which are often regarded as of the same age and origin, but really belonging to a prior epoch, one during which our seas were in conditions comparable to those prevailing on the coast of Labrador and Greenland now. The latter, moreover, are not (except in comparatively few instances) beaches, but elevated sea-bottoms. The true raised beaches of later age indicate rather a slightly warmer temperature in the sea of the Clyde district, due probably to a temporary extension of warm currents northwards.

R. STRIATA, Montagu.

Cylindraceous below, tapering above; whorls rounded, encircled with raised lines, and usually, also, longitudinally ribbed near the sutures: throat smooth.

Plate LXXVIII, fig. 8, 9.

Turbo striatus, ADAMS, Trans. Linn. Soc. vol. iii. pl. 13, f. 25, 26 (probably).—MONT. Test. Brit. vol. ii. p. 312.—MATON and RACK, Trans. Linn. Soc. vol. viii. p. 173.—DILLW. Recent Shells, vol. ii. p. 213.—WOOD, Index Test. pl. 31, f. 106.

.. *semicostatus*, MONT. Test. Brit. vol. ii. p. 326; Suppl. pl. 21, f. 5.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 162. — TURT. Conch. Diction. p. 201. — DILLW. Recent Shells, vol. ii. p. 837.—WOOD. Index Testac. pl. 30, f. 50.

Cingula striata, FLEMING, Brit. Animals, p. 307.—Brit. Marine Conch. p. 178, f. 99 (not well).

Rissoa minutissima, MICHAUD, Nouv. Esp. de Riss. p. 20, fig. 27, 28.—DESH. Anim. s. Vert. vol. viii. p. 480.—POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 274—RECLUZ, Revue Zool. Cuvier. 1843, p. 6.

„ *communis*, Forbes, Malacol. Monensis, p. 17.

„ *striata*, (not Quoy, nor Desh.) JOHNSTON, Berwick. Club, vol. i. p. 271 (with animal).—MACGILLIV. Moll. Aberdeen. p. 152.

Cingula semicostata, FLEMING, Brit. Animals, p. 307. — Brit. Marine Conch. p. 177.

Rissoa gracilis, MACGILL. Moll. Aberd. p. 152, from which *Cingula gracilis*, Brit. Mar. Conch. p. 262 ; copied also, BROWN, Illust. Conch. G. B. p. 129.

Odostomia semicostata, MACGILL. Moll. Aberd. p. 155.

„ *Marionæ*, MACGILL. Moll. Aberd. p. 156 (teste Jeffr. from type); copied, Brit. Mar. Conch. p. 260, and BROWN, Ill. Conch. G. B. p. 130.

Rissoa decussata, BROWN, Illust. Conch. G. B.

Pyramis candidus and discors, BROWN, Illust. Conch. G. B. p. 14, pl. 9, f. 31, 32.

Rissoa semicostata, BROWN, Ill. Conch. G. B. p. 11, pl. 9, f. 1, 2.

The very different look of the adult and immature individuals of this most abundant shell, induced Montagu to regard the latter as a distinct species, which he published under the name of *T. semicostatus*. The *O. Marionæ* of Macgillivray is the same in a rather more advanced stage, the relative proportions of the spire and mouth varying of course with age, and especially in this *Rissoa*, whose penult turn is nearly as large as the final volution. The *R. gracilis* of the same author was also derived, observes Mr. Jeffreys, after an inspection of the type, from a slender worn specimen of this species.

The form of this shell, although varying greatly as to elongation, is always remarkably narrow, being cylindraceous below, and convexly tapering above. Characteristic individuals are rather strong, a little glossy, more or less translucent, and either uniform white (often, however, with a ferruginous tinge) or marked behind the outer lip with two rufous or tawny stains, that severally form the commencement of a subsutural and inframedial zone. The exterior is densely and strongly striated with raised spiral lines, and (except in the variety *candida*) is partially adorned with longitudinal pliciform ribs, that in general are rather distant and oblique, but vary considerably in these respects. The ribs even upon the smaller turns seldom reach the lower suture, and upon the two larger ones extend but a little distance from the upper separating line from whence they emanate. There are six and a half ventricose whorls, divided by a deep but simple suture, and oftentimes placed so irregularly that the shell appears distorted. The apex is blunt; the next two coils are small in proportion to the penult, which is likewise swollen: the body is, in general, almost as narrow as the preceding whorl, and merely occupies from one third of the total length in the produced forms, to two fifths in the abbreviated ones; its basal declination is rounded and gradual. The aperture is suboval, but contracted above, and smooth within; it occupies from about one third to three eighths of the entire length; its peristome is continuous, the parietal enamel being for the most part thickly spread. The projecting outer lip is strong but not marginated behind; it is much arcuated, and at the front extremity is somewhat pouting and well rounded. There is no umbilical chink, the pillar lip, though well defined, being usually appressed. The length of our largest example is only the seventh of an inch, and its breadth about four-fifths of a line.

A slender, almost cylindrical variety, which frequently is only composed of five volutions, and is devoid of the longitudinal ribs, has been termed *candida* by Brown. Its coils are looser, so that there is often a rudimentary umbilical chink, and its texture is thinner, and often of a pale fulvous tint. The *aculeus* of Gould (Invert. Massach. p. 266, f. 172, badly) scarcely differs, except in being more umbilicated, and the *arctica* of Lovén (Index Moll. Skandin. p. 24), though a little more flattened horizontally at the top of the whorls, is also too closely allied. The typical specimen forwarded us by the author, has the whorls proportionally shorter, and does not exhibit any striæ on the extreme base of the shell.

The body of the animal of this species is less in proportion to the shell than that of any other of our native *Rissoæ*. It is entirely yellowish white. The tentacula are linear, and shorter in proportion to the body than usual in the genus. The eyes are very large and black. The foot is obtusely angulated in front, and similarly pointed behind.

This is a most abundant shell everywhere in the British seas. It is plentiful in stony and muddy places between tide marks, especially in the neighbourhood of low-water line. It is also common in the laminarian and coralline zones. The greatest depths to which we have known it range, as observed by Mr. M'Andrew and ourselves, have been twenty-five fathoms, off Penzance, abundant; thirty fathoms in St. Magnus bay, Zetland, in both instances alive; and dead shells in fifty fathoms, off Mizen Head, S.E. of Ireland; forty-five fathoms and eighty-two fathoms off the Zetland Isles. It has evidently a great capacity for enduring varying conditions. It is commoner in the north than the south of Europe; it ranges from Norway to the Mediterranean. It is found fossil in the coralline crag.

R. parva, Da Costa.

Sometimes with longitudinal ribs, sometimes smooth: outer lip marked externally with a curved and oblique chestnut brown line at its upper or posterior corner. Peristome usually edged with brown. A labial varix in the adult.

Plate LXXVI. f. 2, 6; Plate LXXVII. fig. 6, 7; Plate LXXXII. f. 1 to 4.

Turbo parvus, Da Costa, Brit. Conch. p. 104.—Mont. Test. Brit. vol. ii. p. 310. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 171. — Rack. Dorset Catalog. p. 50, pl. 19, f. 4. — Turt. Conch. Diction. p. 215. — Dillw. Recent Shells, vol. ii. p. 857. — Wood, Index Testac. pl. 31, f. 99.

,, *subluteus* and *æreus*, Adams, Trans. Linn. Soc. vol. iii. pl. 13, f. 15, 16, 29, 30 (probably).

,, *costatus*, Pulteney, Hutchins, Hist. Dorset, p. 45, partly.—Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 219, in part (fide Recluz).

,, *lacteus*, Donov. Brit. Shells, vol. iii. pl. 90 (badly).

Cingula parva, Fleming, Brit. Animals, p. 306.—Brit. Marine Conch. p. 176.

,, *alba*, Fleming, Brit. Animals, p. 309, from types.—Brit. Marine Conch. p. 183.

Rissoa parva, Gray, Proc. Zoolog. Soc. 1833, p. 116. — Johnston, Berwick Club, vol. i. p. 272. — Macgilliv. Moll. Aberdeen. p. 149. — Brown, Illust. Conch. G. B. p. 11, pl. 9, f. 55, 56. — Alder Moll. Northumb. and Durh. p. 54.—Potiez and Mich. Galerie Douai, Moll. vol. i. p. 274.—Recluz, Revue Zool. Soc. Cuvier. 1843, p. 7.

,, *alba*, Johnston, Berwick Club, vol. i. p. 272.—Macgilliv. Moll. Aberd. p. 149 (worn), fide Jeffreys from type. — Brown, Illustr. Conch. G. B. p. 12, pl. 9, f. 16 to 19.

,, *obscura*, Philippi, Moll. Sicil. vol. ii. p. 127, pl. 23, f. 10 (from specimens).

? ,, *fuscata*, Brown, Illust. Conch. G. B. p. 10, pl. 9, f. 72.

We consider the curved line of colour, which externally adorns the upper corner of the outer lip, as the distinguishing characteristic of this shell, by which examples of it, even when immature, may be known from the different varieties of *costulata*, *rufilabris*, and *inconspicua*, certain individuals of which approach them in most other particulars. In considering the *interrupta* of authors * to be a smooth, produced, and, for the most part, immature variety of this polymorphous shell, we only adopt an idea which those veterans in British conchology, Messrs. Jeffreys and Clark have entertained for many years, and which, although it may seem unlikely to those whose examples of either form have been selected as intensely characteristic, yet will, we feel assured, be ultimately assented to by all who study like ourselves, from multitudes of specimens, gathered from far apart localities.

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* Montagu's own example is a finely coloured *semistriata*, but his delineation clearly proves that it was not that species which he intended to indicate.

Ordinary specimens of the ribbed or more characteristic variety are moderately strong, glossy, scarcely at all translucent, and of an ovate-conic shape. They display much diversity of colouring, some individuals being wholly squalid white, whilst others are encircled with so broad a band of dark brown, chestnut or fulvous brown on the upper and lower portions of their principal or larger whorls, as only to exhibit a narrow intervening strip of white in the middle of their volutions. Sometimes the dark hue may actually be regarded as the ground colour, the pale strip being confined to the last two coils. The labial varix is white, and the extreme base of the body whorl, as well as the raised sculpture, is usually a shade or two lighter than the general tint, the prominent ribs being oftentimes nearly white throughout their entire length. These last range from eight to twelve upon the body whorl; the lesser number when they are solid and broad, the larger number when, as is sometimes, but not ordinarily the case, they are narrow ; their intervals are broader than the costæ themselves, and are sometimes smooth, sometimes spirally striolate. In characteristic examples the early turns are destitute of sculpture, the ribs being confined to the penult and antepenult turns, and to the upper two-thirds of the body whorl, at the commencement of whose basal declination (often indicated by a raised spiral interstitial stria) they become obsolete. The whorls, which are well defined by a very fine suture, are six or seven in number; they are not ventricose, but only moderately convex or even somewhat flattened. Their longitudinal increase is gradual, and, for the most part, they are rather short than otherwise. The spire, which, in general, scarcely exceeds the body in length, though occasionally it is more produced, ends in a small but not very acute point, that is sometimes whitish, sometimes tinged with purple. The basal slope of the body-whorl is rather gradual, and more or less flattened. The mouth, which occupies two-fifths of the entire length, is roundish oval, a little contracted above, and broadly arcuated below, where it is slightly disposed to expand. The peristome is continuous, and in typical examples is wholly or partially edged with brown or cinnamon colour; it is rather broadly reflected over the pillar. The outer lip is arcuated both above, and, more especially, below, where it is apt occasionally to form an angle with the pillar lip; it is thickened externally by a broad and solid varix-like rib, on the upper part of which is painted a curved and oblique linear streak of brown, whilst the termination of a revolving basal line of the same tint is likewise visible near its lower extremity. Two lines is the full length of individuals; their breadth is rather more than half this measurement.

Turbo interruptus, Adams, Trans. Linn. Soc. vol. v. pl. 1, f. 16, 17 (probably). — Mont. Test. Brit. p. 329; Suppl. pl. 20, f. 8. — Donov. Brit. Shells, vol. v. pl. 178, f. 2.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 166. —Turt. Conch. Diction. p. 205. — Brit. Marine Conch. p. 182. — Dillw. Recent Shells, vol. ii. p. 841.—Wood, Index Testac. pl. 31, f. 62.

Cingula interrupta, Fleming, Brit. Animals, p. 308.

Rissoa interrupta, JOHNSTON, Berwick. Club, vol. i. p. 271 (with animal).—MACGILLIV. Moll. Aberd. p. 150.—BROWN, Illust. Conch. G. B. p. 12, pl. 9, f. 45?—MENKE, Zeitsch. Malak. 1845, p. 41.

The *Rissoa interrupta* of authors being devoid of ribs and in the more characteristic examples both thinner in texture, and narrower and more elongated as well in general shape as proportion of its several parts, has naturally been reputed a distinct species. Nevertheless, as certain individuals which present all its other peculiarities are wholly or partially ribbed, some otherwise typical are solid, and others again have the abbreviated shape and broad volutions of *parva* proper, we cannot perceive any line of demarcation between the two shells. The colouring ranges from the ordinary brown-zoned appearance of *parva*, to uniform horn-colour or dark rufous; the two bands are occasionally, also, broken up into squarish spots· occasionally, likewise, the body is longitudinally painted with slanting or wavy lines of rufous-brown, that are usually but not invariably, interrupted in the middle, and emanate below from the encircling basal band. In pre-eminently aberrant individuals the spire exceeds the length of the body, the basal declination of which is more rounded than usual; in such specimens the mouth is likewise narrower than in ordinary. This smooth form, when adult, has a labial varix similar to the ribbed variety.

By the kindness of Mr. Jeffreys, we have figured (Pl. LXXXII. f. 3.) his unique example of *R. Sarsii* from Loch Carron, which can only be distinguished from the younger shells of the *interrupta* by its superior size and ventricoseness. We do not know the *Sarsii* of Lovén, but his description agrees very fairly, except that the mouth is stated to occupy but one-third only of the total length.

We have delineated, likewise, (Pl. LXXXII. f. 1.) a solid chocolate coloured variety, which has the exact shape of the typical *parva*, but is quite destitute of ribs. The individual itself is smooth, but obsolete spiral lines are wont to appear on the neighbouring variety *fasciata*, in which the coloured zones being continuous, the shell reminds one of *cingillus*.

Plate LXXVI. fig. 2, represents the *R. discrepans* of Brown (Illustr. Conch. G. B. p. 13, pl. q, f. 70, 71) which we take to be rather a monstrosity than a distinct variety. The whorls are looser and more rounded than usual, and here and there one of them, at random, displays an isolated series of longitudinal ribs.

The animal is yellowish-white except the mouth and summit of the head, which are often, but not always, orange-tawny, sometimes inclining to dark purple, and the lateral lobes, which are similarly tinged. The tentacula are white, long, and setaceous, with eyes conspicuous on their outer bulging bases. The lateral lobes are large and conspicuous. The foot is shorter than the body whorl, narrow, slightly squared in front, pointed behind. On the caudal extremity is an operculigerous lobe, furnished posteriorly with a prominent white tail filament.

The form *parva* is abundant all around our shores; plentiful everywhere dead in shell-sand, and living under stones and among corallines near low-water-mark. Hence it ranges in great quantity throughout the Laminarian region. We have dredged it alive in twelve fathoms, Weymouth, and twenty fathoms off Penzance, and Mr. M'Andrew has taken dead specimens in from forty-five to fifty-five fathoms water off Cape Wrath and the Zetland Isles. Lieut. Thomas remarks that it occurs clustered in immense numbers on the branches of *Corallina officinalis*, in four fathoms among the Orkneys, and that he has dredged it in forty fathoms water between the Orkneys and Fair Island. It ranges from the North Seas to the Mediterranean.

The form *interrupta* does not appear to have so great a range in depth, and is perhaps more abundant in the North than in the South, though common enough everywhere, especially congregating in the Laminarian zone. We have never dredged it deeper than in twelve fathoms water.

R. COSTULATA, (Risso ?) Alder.

Oblong, conic, strongly ribbed lengthways, and more or less striolate in a spiral direction. Mouth not patulous. Peristome tinged with purple. Labial varix white, not painted with any linear markings.

Plate LXXVII. fig. 4, 5.

? *Turbo costatus*, Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 219, in part ?
Turbo variabilis, Megerle Mühlf. Verh. Berlin. Ges. Nat. vol. i. p. 312, in part. ?
Rissoa costulata, Risso, H. N. Europe Mér. vol. iv. p. 119, probably. — Alder, Ann. Nat. Hist. vol. xiii. p. 324, pl. 8, f. 8, 9.
? „ *similis*, Scacchi, Catal. p. 14. 2, teste Philippi, Moll. Sicil. vol. ii. p. 124, pl. 23, f. 5.
? „ *Guerinii*, Recluz, Revue Zool. Cuvier. 1843, p. 7.

The presumed recognition of Risso's species in the present shell rests chiefly on the authority of a specimen marked as such by M. Michaud; for the identification of Risso's shells is always attended with uncertainty, since that author was neither adequately conversant with the writings of others, nor in the habit of clearly defining the objects he proposed to describe. Hence we look upon our native shell rather as the *costulata* of Alder, whose description is most admirable, than as accurately corresponding to the expressions "épaisse—a neuf tours de spire, punctulés de ferrugineux" of Risso, whose language altogether coincides fairly with the characteristics of the *costata* of Desmarest and Philippi. This last writer previous to the publication of the second volume of his "Enumeratio Molluscorum Siciliæ," sent us examples as the *oblonga* of his work; but his diagnosis of that shell induces the supposition, that they belong rather to the *similis* which he subsequently distinguished from *oblonga*.

The shell is of an oblong-conic shape, is moderately strong, not particularly lustrous, only slightly translucent, and of a squalid white, more usually with the intervals of the costæ of a fulvous brown. The larger volutions are adorned with about eight to ten longitudinal ribs, which are thick, blunt, rather distant, and strongly elevated. They extend from suture to suture on the penult and preceding turn, but only reach two-thirds down the body, from the dorsal half of which, indeed, they are frequently entirely absent. Their intervals are marked with more or less perceptible spiral wrinkles, that are at times changed into flat costellar lines, with obliquely longitudinal striulæ between them; hence, worn individuals are apt to appear encircled with impressed dots. Of the eight slowly increasing volutions the first four or smaller whorls are almost always smooth. The body is scarcely broader than the preceding turn, and only occupies from two-fifths to three-sevenths of the total length; its surface is rounded, and its basal declination is convex and gradual. The penult whorl is more or less tumid; the apical turns more or less flattened; the apex itself is small, yet not very acute. The suture is fine, but distinct. The mouth, which occupies two-fifths of the total length, is moderately projecting, rather obliquely oval or rounded oval, scarcely at all contracted above, and broadly or moderately rounded below. The peristome is continuous, and of a lilac colour, which varies considerably as to depth and purity: the throat is white and quite smooth. The outer lip, whose acute edge is for the most part somewhat thickened at the top, and is marginated externally by a solid white rib or varix, that is never painted with a crescent-like linear mark as in *parva*, is well arcuated, advances a little in the middle, and is disposed to expand at the base. The curvature of the inner lip is much less than that of the opposite margin: the pillar-lip is shelving, not particularly broad, and is slightly raised at the inner or attached edge, but displays no umbilical crevice. Minute and crowded longitudinal wrinkles are often perceptible upon the labial varix.

The length of a fair-sized example was the fifth of an inch; its breadth a single line.

This is a southern form on our shores. It occurs in Herm, dead on the shore; at Ryde in company with *labiosa*; at Torquay along with *parva* (S. H.). Mr. Alder who first recorded it as British, procured it from small sea-weeds collected in Torbay, " where it appears to be tolerably abundant." Exmouth (Clark) Weymouth; Manorbeer (Jeffreys); Dawlish (Mrs. R. Smith); Brook, in the Isle of Wight; " Roundstone and Birterbuy bays on the western coast of Ireland, where it was found by Dr. Farran and Mr. Barlee (W. Thompson); Cork (Jeffreys).

It ranges to the Mediterranean; Mr. M'Andrew has taken it on the coast of Spain.

R. RUFILABRUM, (Leach) Alder.

Small, solid, with numerous rows of punctures on the dorsal surface of the body-whorl, whose ventral surface, along with the penult turn is, for the most part, densely and coarsely ribbed: peristome tinged with purple: outer lip margined by a broad white varix.

Plate LXXVII. fig. 8, 9.

Rissoa hyalina, DESMAR. Bullet. Soc. Philomat. Paris, 1814, p. 8 (copied DESH. Lam. Anim. s. Vert. vol. viii. p. 473), pl. 1, f. 6, young?
„ *punctata*, POTIEZ and MICH. Galerie Douai, Moll. vol. i. p. 274, pl. 28, f. 3, 4?
„ *lilacina*, RECLUZ, Revue Zoolog. Cuvier. 1843, p. 6, probably.
Cingula rufilabris, of Leach? BEAN, Brit. Marine Conch. p. xl. fig. 46.
Rissoa rufilabrum, ALDER, Annals Nat. Hist. vol. xiii. p. 325, pl. 8, f. 10, 11 (as *Alvania rufilabrum* of Leach, MSS.).

In the uncertainty which prevails as to whether either of the first two cited species may have been constituted from the immature state of this very distinct shell, we have preferred to retain the appellation by which the species is generally known to British collectors, although the description of *lilacina* agrees so far well, that we were almost tempted to substitute that name from its prior publication. The synonymy of the *Rissoæ* has proved very laborious, for we have had to compare each of our British species with between one and two hundred exotic ones, very many of which (those of Cantraine and Möller, for example) are so meagrely characterised, that we have not ventured to refer to them, even where they approach the features of our indigenous shells. Moreover, a conversance with foreign collections has taught us, that the range of variation for each species is far wider than is generally imagined, so much so indeed, that we can scarcely determine the limits of certain specimens of the *rufilabrum* and those of the *costata* of Desmarest. The *violacea* again is a close ally.

This solid *Rissoa* ranges in shape from ovate-conic to oval conic, is scarcely translucent, has a resinous gloss, and varies in tint from whitish horn-colour to dirty violet or purple: when adult the hue is generally uniform, or the pale ground is broadly and obscurely zoned with the darker shade; but in younger shells the whorls are traversed lengthways by rather distant linear streaks of fulvous or yellowish brown, which almost invariably disappear upon the formation of the longitudinal ribs. These last when present at all (which, however, is usually the case in the fully matured individuals) do not extend to the base of the body, but merely reach about half way down, are most conspicuous upon the penult turn, occasionally run up the antepenult, but rarely if ever appear on any of the smaller turns. These ribs are strong, closely disposed, and more frequently oblique than otherwise; their interstices are narrow and spirally striated with obsoletely raised lines, the intervals of whose crowded decussation by still more obscurely elevated longitudinal wrinkles upon the ribless dorsal surface of the final whorl, cause the shell to appear punctured in regular (not quincuncial) rows. The volutions, whose longitudinal increase is moderately quick, are divided by a simple fine and oblique suture, and (except the last two) are rather short and somewhat flattened; of the six or seven, which compose the spire, and rapidly slope to a rather fine point, the smaller or upper ones are perfectly smooth. The basal declination of the body, which occupies one half of the entire dorsal length, and in the more typical examples is about as broad as it is long, is gradual, and not much rounded; upon the ventral side, indeed, it is rather flattened. The mouth, whose proportion to the total length is as three to seven, is nearly ovate, a little contracted above, and well rounded below. The peristome is continuous, and of a lilac or violet brown hue; the throat is smooth, and of a pure white. The outer lip is thickened externally by a very broad white varix-like rib, that is usually stained with fulvous brown, at its base, and near the outer edge, but is never marked posteriorly with the arcuated coloured line of the allied *parva* (neither is there any spiral band at the base of the shell). It is not very convex above (where it is somewhat projecting), but curves rather abruptly below, so as to quickly attenuate the extreme base of the body; before the formation of the varix, it has a tendency to expand. The inner lip is much spread upon the parietal surface, and is appressed and somewhat reflected below: the pillar-lip is rather long and almost perpendicular (though curved); there is no umbilical crevice. A fair-sized example measured two lines and a half in length, and a line and a third in width.

The animal, of which a drawing has been kindly communicated by Mr. Alder, has the head, muzzle, margins of the much developed lateral lobes, and the central sides of the foot tinged with rich dark brown. The tentacles are subulate, white with a yellow line; the eyes are placed within white spaces on the bulgings at their external bases. The foot is somewhat rounded in front, pointed behind, and bears at the extremity of the operculigerous lobe a rather long caudal filament.

It is a southern and western species. Brighton and Torquay (Alder); at Ryde along with *labiosa*, and at Torquay along with *parva*, but not common (S. H.); Oban, Loch Fyne, Loch Carron, and elsewhere on the west coast of Scotland (Jeffreys). "On the east, west, and south coast of Ireland: I obtained it at Bangor in

Belfast Bay in 1835" (W. Thompson). It is, probably, an inhabitant of *Zostera* grounds.

R. LABIOSA, Montagu.

Large, horn-coloured, sometimes with longitudinal, rib-like folds, sometimes smooth, and with longitudinal tawny lines, no spiral sculpture, nor impressed dots; whorls flattened: mouth large, patulous, more or less thickened at the outer lip.

Plate LXXVI. fig. 5; Plate LXXVII. f. 1, 2, 3; Plate LXXXI. f. 3.

Turbo membranaceus, ADAMS, Trans. Linn. Soc. vol. v. p. 2, pl. 1, f. 14, 15 (badly).
„ *costatus*, PULTENEY, Hutchins, Hist. Dorset. p. 45, in part.
Helix labiosa, MONT. Test. Brit. vol. ii. p. 400, pl. 13, f. 7.
Turbo labiosus, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 164.—RACK. Dorset Catalog. p. 49, pl. 18, f. 16. — TURT. Conch. Diction. p. 203. — DILLW. Recent Shells, vol. i. p. 840. — WOOD, Index Testac. pl. 31, f. 57.
Cingula labiosa, FLEMING, Brit. Anim. p. 307. — Brit. Marine Conch. p. 179, f. 42.
Rissoa „ BROWN, Illust. Conch. G. B. p. 10, pl. 8, f. 19.
? „ *pulla*, BROWN, Illust. Conch. G. B. p. 13, pl. 8, f. 25.
„ *membranacea*, LOVÉN, Index Moll. Scandin. p. 24 (probably).

Like most members of its genus, this large species of *Rissoa* exhibits a considerable latitude of variation in both form and sculpture; the style of colouring, at least in native examples, is apparently more constant, the lineated painting being confined to the thinner and smoother individuals. In the more characteristic specimens, the shape ranges from oval-conic to oblong-conic, the texture is rather solid, yet a little transparent, resinously lustrous, and of an uniform pale horn-colour or dirty white. The earlier turns are quite smooth, the body and two preceding whorls are decorated with longitudinal pliciform ribs, that range in prominence from strong and projecting to depressed and almost obsolete; they usually widen below, are closely set, and for the most part are broader than their narrow and perfectly smooth intervals. In general they are wont to become obsolete on the upper part of the antepenult, and more especially upon and towards the slowly contracted and somewhat produced base of the body-whorl. The spire, which is attenuated to rather a fine point, that is sometimes white, sometimes purple, is composed of six volutions, that barely equal the length of the body-whorl, are but little convex, except that the penult turn swells out a little towards the lower suture, and are well defined by a simple separating line, that becomes rather broader and stronger as it descends. The mouth, which occupies about one-half of the entire length of the shell, is large and subovate; its throat is smooth, and of a pure porcelain-white. The outer lip is marginated behind, but is thin at the edge, which is disposed to expand, especially at the rounded and projecting anterior extremity. The pillar-lip is much reflected, but with no distinct umbilical chink behind it; it is rather long, broad, shelves much inwards, and is furnished with a more or less distinct fold, that lies rather below the middle of the aperture. We possess a stunted form of this variety, in which the spire occupies only two-fifths of the shell, and the big mouth is edged internally with dirty purple.

The thinner or membranaceous variety affects muddy estuaries. It is usually more or less devoid of ribs, is pale fulvous, and often variegated with obliquely flexuous rufous lines, which in intermediate examples meander between the almost obsolete costæ. The fold of the pillar-lip, which has occasionally a ruddy hue, is usually less developed than in the more solid individuals. Both in this and the typical form the longitudinal increase of the whorls, which nowhere exhibit the slightest trace of spiral striæ (as in the allied *ventricosa*), is particularly marked upon the penult volution, which, curiously enough, projects oftentimes at the suture beyond the edge of the final whorl. The degree of obliquity and projection in the mouth varies in different individuals. Live specimens are covered with a tawny epidermis.

We do not feel disposed to augment the number of our British *Rissoæ* by the admission as a species of *R. venusta* (Philippi, Moll. Sicil. vol. ii. p. 124, pl. 23, f. 4), of which shell Mr. Barlee has taken a few examples at Weymouth, (Pl. LXXVI. f. 5.) that perfectly coincide with typical specimens presented to us by the author of the species. They are not unlike the ordinary ribbed form, but are of a waxen-yellow tint, have their folds more remote, less spread, and, for the most part, somewhat swollen both above and below. The aperture is smaller and less expanded than usual, and both body and spire are somewhat shortened.*

Fair-sized specimens measure about two-fifths of an inch in length, and are about the seventh of an inch at the broadest part. These proportions are very variable; the general rule being, however, that the more solid the examples, the more abbreviated is their shape, and *vice versâ*. Mr. Barlee has dredged some remarkably thin and smooth individuals, (Pl. LXXXI. f. 3.) which are actually turreted, their length being a quarter of an inch, their breadth only a single line. In these individuals (which remind one not a little of *R. auriscalpium*) the mouth only occupies two-fifths, at most, of the entire length, and the margination of the lip is almost obsolete.

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* The *R. elata* of Philippi (Moll. Sicil. vol. ii. p. 124, pl. 23, f. 3) is also most closely allied to the British species. So too we suspect is the *grossa* of Michaud (Esp. de Ris. p. 70, f. 21, 22), which is ascribed to England by both that author and Deshayes (Lam. Anim. s. Vert. vol. viii. p. 472). The *plicatula* of Risso (Eur. Mér. vol. iv. p. 143, f. 134) has somewhat the look of it likewise, and Recluz's description of *R. Soulcyetana* (Rev. Zool. Cuv. 1843, p. 5) agrees fairly enough with this shell, except that he allows it but six volutions.

The animal has a pale or slightly brown-tinged yellow head and snout, with white subulate tentacles and spaces round the eyes. The central or contracted portion of the sides of the foot are coloured with dark purple, as also are the well-developed lateral lobes. The foot is slightly squared in front, pointed behind, and bears behind the operculigerous lobe a conspicuous white caudal filament.

The favourite habitat of this species is on the leaves of *Zostera* in sandy or muddy places. It is chiefly found on our southern and western shores. The solid variety occurs in three fathoms water, near the pier at Ryde, in the Isle of Wight; the smooth form is chiefly found where there is an intermixture of mud, as at Tenby, Margate, and Weymouth (S. H.). At Southampton it is abundant in from one to three fathoms water (E. F.) Falmouth; coast of South Wales; Oban, and Loch Carron, in Scotland, (Jeffreys). In various localities around the Irish coast (W. Thompson).

It ranges from the shores of Norway to the Mediterranean.

R. INCONSPICUA, Alder.

Not particularly minute, ranging in shape from oblong-conic to abbreviated ovate-conic; either wholly white, or spotted or longitudinally streaked with fulvous or rufous on a yellowish white ground. Whorls decidedly convex, not perfectly smooth, nor distinctly cancellated; if not ribbed, yet always with traces of longitudinal or spiral obsoletely projecting lines. Mouth shorter than the spire, not edged with lilac or rufous, nor painted externally with any arched line of colour (as in *parva*). Throat smooth. A subumbilical crevice.

Plate LXXVI. fig. 7, 8; LXXXII. fig. 5 to 9.

? *Turbo albulus*, ADAMS, Trans. Linn. Soc. vol. iii. pl. 13, f. 17, 18.—MATON and RACK, Trans. Linn. Soc. vol. viii. p. 185.—TURT. Conch. Diction. p. 230.

Rissoa inconspicua, ALDER, Annals Nat. Hist. vol. xiii. p. 323, pl. 8, f. 6, 7.

„ *maculata*, BROWN, Illust. Conch. G. B. p. 12, pl. 9, f. 5, 6. ?

„ *similis*, BROWN, Illust. Conch. G. B. p. 13, pl. 8, f. 20. ?

The *Rissoa inconspicua* is perhaps one of the most variable of the genus, or rather is that British species of which we possess the greatest modifications in form and sculpture. Mr. Alder's original delineation of it combines characters that are not often found together in such high development; hence, despite its correctness, few specimens would be positively determined by comparison with it. The shape ranges from abbreviated ovate-conic to oblong-conic, but certain fixed conditions appear to accompany the difference of figure; the broader individuals being ribbed, solid, and more or less marginated at the lip; whilst the more produced examples are thin, semi-transparent, comparatively smooth, and have the margin of the lip more or less acute. The surface is of a glossy white, either uniform (as in the more solid and dead individuals) or with a yellowish tinge, and occasionally painted with rather broad wavy and somewhat remote tawny or rufous longitudinal streak-like spots, that run from the upper suture, and do not either reach the lower one or intermingle usually with the second series which is disposed upon the base of the final volution. The more solid examples are usually marked on the three last whorls, with very numerous narrow, and often oblique longitudinal folds; these occasionally, especially on the more fragile individuals, become obsolete, and sometimes the surface appears almost smooth, yet when closely scrutinized the traces of folds are almost always perceptible; usually, also, the costal interstices are spirally traversed by rather distant striæ, but these likewise are often very obscure, and are chiefly distinguishable (where the ribs vanish) upon the base of the body-whorl. There are six or seven whorls, which, though only divided by a nearly horizontal simple yet well pronounced suture, are peculiarly well defined, owing to their being decidedly convex, or even ventricose; they are a little more shelving above, are gradual as to their longitudinal increase, and end in a very small but blunt apex. The body, which is much rounded, rarely exceeds two-fifths of the entire length of the shell; it is more or less abruptly rounded at its basal declination. The length of the penult is not, in general, one half its breadth. The mouth is small, and in the more stunted forms occupies two-fifths of the ventral length; but in the more produced varieties is only half as long as the spire above it: it is typically suborbicular, and projects towards the base, which latter is broadly rounded. The throat is quite smooth. The outer lip is much arcuated, and more frequently acute, but is sometimes marginated externally by a narrow but prominent varix-like rib, which is not distinguished from the general tint by any peculiar colouring. The pillar-lip, whose attached or inner border is a little raised, is straightish, and almost perpendicular; it is remarkably narrow, occupies a considerable portion of the inner lip, and is more usually flanked by a kind of subumbilical crevice. The usual sizes range from the seventh of an inch and half as much in breadth, to the tenth of an inch and two-thirds as much in width. Some narrow transparent smoothish streaked examples from Rothsay, however, measured the fifth of an inch long.

In the shape of the mouth and pillar it resembles the *R. albella* of Lovén; yet as all the examples of it with which we have been favoured by the author present a more abbreviated figure, stronger ribs, and a shorter spire, we have not cited that species as identical. Nevertheless, we are far from sure that this is not the case.

We are disposed to group together our specimens into four principal varieties, each of which runs so closely into the succeeding one, that it is difficult for those who possess a large number of individuals to definitively arrange the whole of them under their appropriate heads.

VAR. A. (the traditional *albula* of Adams.) Solid, abbreviated, uniform white; ribs regular, almost perpendicular, with spirally striated intervals; lip usually marginated (pl. LXXVI. f. 8).

VAR. B. (*typical or first-named*) ovate conic; pale fulvous, with darker spots, and a purple apex; numerous very fine longitudinal folds, that are often partially reticulated by obscure spiral lines; pillar often rufous (pl. LXXXII. f. 5, 6).

VAR. C. (*tenuis*). Produced, thin, either spotted or streaked with coloured lines that run down from the upper suture, but do not extend to the lower one. Whorls seven, almost smooth (at most very obscurely subcancellated), but almost always with some obscurely raised spiral lines that are here and there perceptible: lip rarely marginated, pillar sometimes coloured (pl. LXXXII. f. 7, 8). This form, especially where the lower set of streaks unite at the base of the body into a spiral zone, closely resembles the R. *parva*, var. *interrupta*, from which the straightness of its pillar-lip, its more ventricose whorls, the obscure traces of spiral sculpture, and the absence of the characteristic dorsal painting of the outer lip suffice to distinguish it.

Var. D. (? *similis* of Brown). Elongated thin; lower whorls almost smooth; upper ones with a few strong longitudinal ribs (pl. LXXXII. f. 9).

Mr. Alder has examined and described the animal of this species. It is "white, with two long setaceous tentacula, having the eyes at their external base. Head bilobed. Foot slender, produced in front, white, with a black spot in the centre of the posterior part. The sides have two lobe-like appendages, margined with dark purple or black: two other lines of the same colour, on each side, run parallel to these; the upper one on the side of the back, the lower bordering the foot. The rest of the body is white, with some blotches of yellow.*

The animal of the form *tenuis*, found sparingly by Mr. Alder at, and a little below, low-water mark, at Rothsay, is described by him as having "the head umber-brown above, the muzzle not quite so much produced as usual, tentacles transparent white, with opaque white spots; the foot has on the upper anterior part a bilobed fold, margined with black below; behind this the foot is opaque white for a short way, the hinder part is semitransparent, with a darkish streak in the centre, the sides are margined with purplish-brown; the lateral appendages are brown on the anterior half, and whitish behind.

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* Annals Nat. Hist. vol. xiii. p. 324.

Rissoa inconspicua appears to range all round the shores of Great Britain. It was first described under its received name by Mr. Alder, who obtained it "from deepish water, among corallines," on the Northumberland coast. In the south it is found at Torquay (S. H.); Southampton, Weymouth, Falmouth, Exmouth, Tenby and Manorbeer (Jeffreys); Scarborough (Bean); Doggerbank (Howse); Oban and elsewhere in the west of Scotland; Lerwick (Jeffreys). In Ireland it has been found at Portmarnock (Thompson); Bantry Bay, Dublin Bay, and Birterbuy Bay (Jeffreys).

It ranges to Sweden.

R. SEMISTRIATA, Montagu.

Conic, rather strong, not ribbed; whorls rounded, partially striated in a spiral direction; body equal in length to the spire, and quite as broad as it is long, encircled with two or three rows of squarish spots; pillar white, rather broadly reflected.

Plate LXXX. fig. 4, 7.

Turbo semistriatus, MONT. Test. Brit. Suppl. p. 136, pl. 21, f. 5.—TURT. Conch. Diction. p. 201.—DILLW. Recent Shells, vol. ii. p. 842.

Cingula semistriata, FLEMING, Brit. Animals, p. 309.—Brit. Marine Conch. p. 183, fig. 90 (badly).

,, *pulchra*, JOHNSTON, Edinb. Philosoph. Journ. vol. xix.; copied in Brit. Marine Conch. p. 261.

Rissoa tristriata, THOMPSON, Annals Nat. Hist. vol. v. p. 98, pl. 2, f. 10.

Macgilliv. Moll. Aberd. p. 151.—Brown, Illust. Conch. G. B. p. 129.

Rissoa semistriata, Johnston, Berwick. Club, vol. i. p. 271.—Macgilliv. Moll. Aberd. p. 149.—Brown, Illust. Conch. G. B. p. 11, pl. 9, f. 3.

„ *subsulcata*, Philippi, Moll. Sicil. vol. ii. p. 129, pl. 23, f. 16 (from specimens).

The greater or lesser extent of the sculptured surface, and the distinctness or obsoleteness (from abrasion or bleaching) of the coloured markings, have caused the appearance of this easily recognised species under several appellations. It is distinguished from several shells that approach it in painting, by its peculiar shortness and comparative solidity. It is of an ovate-conic shape, rather strong, moderately glossy, semi-transparent, and of a white or pale fulvous tint, marked with spiral series of squarish or elongated spots of rufous or yellowish brown, and encircled with strongly impressed and not very densely disposed striæ, which rarely occupy the entire surface, but are chiefly perceptible upon the base of the body and immediately beneath the upper sutures. The first stria or two beneath each divisional line is peculiarly profound; the smaller turns are often traversed, likewise, by obsoletely raised longitudinal wrinkles. The spots of the upper row are the larger, and run immediately under the broad and profound suture; a second smaller (and upon the lesser volution less distinct) set follow them at some little distance, and are succeeded upon the body-whorl by a third and closely adjacent series, but the last two are apt to become confluent; these coloured markings do not extend to the extreme base of the shell. The spire is composed of five decidedly convex, or subventricose whorls, which rapidly slope to a somewhat obtuse point; their longitudinal increase is rather quick; they are mostly short, but the penult volution is scarcely more than twice as broad as it is long. The width of the body is equal to its length, which last vies, at the least, with that of the spire; the basal slope is rather abrupt, and decidedly rounded. The mouth, which occupies three-sevenths of the total length, is obliquely, and generally broadly, pear-shaped, being much contracted above, and well rounded below; the peristome is continuous; the throat is smooth. The outer lip is simple, acute, moderately projecting, convex above, and much arcuated below; it is not patulous. There is no distinct umbilicus, but a linear hollow exists beyond the slightly elevated edge of the rather broadly reflected pillar-lip, which last is white, shelving, subarcuated, and almost perpendicular. Specimens rarely measure more than the tenth of an inch in length, and rather more than half as much in breadth.

The animal of this species has not been observed.

This species, though its range extends all round the British islands, appears to become much scarcer northwards, and is possibly absent from the Zetland shores. It is chiefly an inhabitant of the Laminarian zone, whence it is cast up among shell-sand, but ranges into the commencement of the region of Corallines. We cite a few of its localities; Herm, dead on the strand; Torquay, along with *parva* (S. H.); Dartmouth in seven fathoms, Milford Haven in twelve fathoms water (M'Andrew and E. F.); many localities on the south and north-west coast of England, also at Oban and elsewhere on the west coast of Scotland (Jeffreys); Scarborough (Bean); Northumberland (Alder); Berwick (Johnston); Firth of Forth in seven fathoms (E. F.); Aberdeenshire (Macgillivray). In shell-sand from Magilligan, Bundoran, and elsewhere, in Ireland (W. Thompson); Bantry Bay and Cork harbour (Jeffreys).

It ranges to the Mediterranean.

R. RUBRA, Adams.

Oval-conic, rufous, or with a pale spiral band on a rufous ground: whorls decidedly convex, quite smooth: outer lip not marginated.

Plate LXXVIII. fig. 4, 5; Plate LXXX. f. 3.

Turbo ruber, ADAMS, Trans. Linn. Soc. vol. iii. pl. 13, f. 15 (probably).—MONT. Test. Brit. vol. ii. p. 320.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 162.—TURT. Conch. Diction. p. 202.—Brit. Marine Conch, p. 182, f. 26.—DILLW. Recent Shells, vol. ii. p. 838.—WOOD, Index Testaceolog. pl. 31, f. 51.

„ *unifasciatus*, MONT. Test. Brit. vol. ii. p. 320; Suppl. pl. 20, f. 6.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 163.—TURT. Conch. Diction. p. 203.—DILLW. Recent Shells, vol. ii. p. 839.—WOOD, Index Testaceolog. pl. 31, f. 55.

Cingula rubra, FLEMING, Brit. Animals, p. 308.

„ *unifasciata*, FLEMING, Brit. Animals, p. 309.—Brit. Marine Conch. p. 182.

Rissoa fulva, MICHAUD. Nouv. Esp. de Riss. p. 15, fig. 17, 18.—PHILIPPI, Moll. Sicil. vol. i. p. 152; vol. ii. p. 129.—POTIEZ and MICH. Galer. Douai, Moll. vol. i. p. 269.

„ *unifasciata*, RECLUZ, Revue Zool. Cuvier. 1843, p. 10.—BROWN. Ill. Conch. G. B. p. 13, pl. 8, f. 28.

„ *rubra*, MACGILLIV. Moll. Aberd. p. 328.—BROWN, Illust. Conch. G. B. p. 12, pl. 9, f. 17.

Although the Mediterranean examples of *R. fulva*, generally considered as more peculiarly synonymous with *R. unifasciata*, have their spire somewhat more produced than is the case in our native specimens, we cannot perceive the slightest difference, besides colour, between the *rubra* and *unifasciata* of our own shores. This in the typical form is of an uniform red, that ranges from tawny rufous to vinous crimson; whilst in the variety a single broad central zone of colouring adorns the body, whose base and subsutural region are alike encircled by a pale band; of these the upper and broader one winds along the top of the smaller turns, so that the shell appears alternately striped with the lighter and darker hue.

The shell is a little translucent, and its texture rather thin or moderately strong; the surface is glossy and quite smooth, and the shape is oval-conic. There are from five to six whorls, which are tolerably, but decidedly, convex, rather more rounded below, and considerably narrowed above, since the attenuation of the spire (whose apex is blunt, and almost mammillary) is rather quick; their longitudinal increase is rather gradual; their sutural line is simple, but distinct. The body, which is rather broad in proportion to its length, whose basal declination is rounded, and whose anterior contraction is rather sudden, is about equal in length to the spire. The mouth, in perfect individuals, generally occupies from three-eighths to one half of the entire length, but in worn ones (and such are those of most cabinets) is usually so abraded as to fill only two-fifths of the actual length; it is oval-orbicular, and is broadly rounded at the anterior base. The outer lip is simple, acute, arcuated, and peculiarly prominent below; its edge is usually paler, owing, perhaps, to its greater tenuity. The pillar-lip, on the contrary, frequently exhibits a deeper tone of colouring; it is not much reflected, and there is scarcely any perceptible chink behind it. Specimens rarely exceed the seventh part of an inch in length.

We have a note of the animal of the *unifasciated* form of this species, communicated by Mr. Jeffreys. It would appear to resemble that of *ulvæ* in several respects. It is stated to be "of a light yellowish colour with occasional brownish streaks or blotches on the upper part and sides of the body; the tentacles are very long and setaceous, with a similar black bar to that in *Rissoa ulvæ* below their tips."

It appears to be a widely distributed, but nevertheless rather scarce species. It inhabits the laminarian zone and the shore near low-water-mark. The Channel Isles, Herm (S. H.); Tenby (Lyons); Whitesand Bay (Jeffreys); Land's End (Barlee); Whitley, Northumberland (Fryer in Alder Cat.). Laskey found it in the east coast of Scotland at Dunbar, and Macgillivray records it from the Buchan Coast. In some places on the north, east, and west coasts of Ireland (W. Thomson).

It ranges to the Mediterranean.

R. CINGILLUS, Montagu.

Oval-conic, usually with three coloured zones on the body, which is girt with obscure rounded costellar striæ; whorls flattish; mouth oval-pyriform.

Plate LXXIX. fig. 9, 10, and (Animal), Plate J. J. fig. 4.

Helix pella, Linn. Syst. Nat. ed. 12, p. 1249. ?
Turbo cingillus, Mont. Test. Brit. vol. ii. p. 328, pl. 12, f. 7; Suppl. p. 125.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 165.—Turt. Conch. Diction. p. 205.—Dillw. Recent Shells, vol. ii. p. 841.—Wood, Index Testaceolog. pl. 31, f. 61.
,, *vittatus*, Donovan, Brit. Shells, vol. v. pl. 178, f. 1.
,, *graphicus*, Turton, Conch. Diction. p. 200, f. 34.—Brown, Mem. Werner. Soc. vol. ii. pt. 2, p. 521, pl. 24, f. 6.
Cingula cingilla, Fleming, Brit. Animals, p. 309.
Rissoa cingilus, Michaud, Espèces de Rissoa, p. 14, f. 19, 20.—Potiez and Mich. Gal. Douai, Moll. vol. i. p. 268.
,, *rupestris*, Forbes, Ann. Nat. Hist. vol. v. p. 107, pl. 2, f. 13.—Brit. Marine Conch. p. 184.
vittata, Recluz, Revue Zool. Cuvier. Soc. 1843, p. 10.
,, *cingillata*, Macgilliv. Moll. Aberdeen. p. 328.
Cingula cingillata, Brit. Marine Conch. p. 182, f. 51.
Rissoa graphica, Brown, Illust. Conch. G. B. p. 12, pl. 9, f. 83.
Pyramis cingillus, Brown, Illust. Conch. G. B. p. 15, pl. 9, f. 73.

This pretty species of *Rissoa* varies in shape from oval conic, to semifusiform, is tolerably strong, or at least not very thin, a little translucent, and with a resinous lustre. It is whitish or yellowish horn colour, and is encircled in the typical examples with bands of rufous brown or intense fulvous; three upon the body and two upon the penult and antepenult volutions. Of the zones upon the final whorl, the middle one, which follows the line of the junction of the outer lip to the body, is the principal; only a narrow strip of it is perceptible at the lower suture of the smaller turns; the upper band, which is the more marked one upon the earlier volutions, is usually rather narrower, and lies at some distance from the suture; the third or terminal one encompasses, and often stains the columella, which last is occasionally also tinged with liver-colour. Numerous rounded costellar striæ wind round the body whorl, and although apt to become partially obsolete elsewhere, are always distinctly visible upon the basal area of adult examples; for the most part, too, obscure and irregular wrinkles traverse the shell lengthways. There are about six and a half whorls, whose convexity is so trifling, that the lateral outlines are nearly rectilinear. They are rather short, and are divided by a clearly defined yet simple suture. The body occupies from two-fifths to three-sevenths of the total length, but usually the former proportion. The commencement of the basal slope, from its usual flatness, is more or less subangulated. The apex is very small, but blunt. The mouth, which is smooth within, and occupies about two-fifths of the total length, is oval-pyriform, being rounded, though often somewhat narrowly, below, and contracted to a point above. The outer lip is acute, not much arcuated, and not at all projecting. The pillar is shelving, tolerably broad, and elevated at its inner margin: the parietal enamel is usually profuse in adult examples. A sixth of an inch for the length, and a line or rather more than a line for the breadth, are the ordinary proportions.

The variety termed *graphica* by Turton, is rather stronger than usual, and has its zones much more faintly displayed. It is not uncommon at Weymouth, under stones near the old castle, &c., (S. H.).

In typical specimens of the aberrant form *rupestris*, the shell is nearly of an uniform white, and the spiral striæ are obsolete above the angulated commencement of the basal slope. The seeming subsutural line is not impressed, but is merely the overlapped base of the preceding turn revealed by the more than ordinary transparency of the shell.

The animal is of a yellowish white, sometimes (in the normal form) slightly tawny, sometimes (in var. *rupestris*) more of a milky hue. The snout is prominent, narrow, and translucent, showing the jaws and tongue shining through; the tentacles are very long and linear, bearing the conspicuous black eyes on their opaque white bulging bases. The foot is narrow and oblong, angled, but not sharply, in front, obtusely pointed behind. The caudal cirrhus, if present, is small; we have not been able to see it. When the creature is at rest the foot is much contracted, and the tentacles are turned back on the shell. When in motion it moves its tentacles in a waving manner alternately; a habit common to other species of the genus.

Rissoa cingillus is strictly a littoral animal, abounding between tide-marks in muddy, rocky, and stony places almost everywhere around the shores of Britain and Ireland. The variety *graphicus* is scarce; it occurs at Langland, near Swansea (Jeffreys). The form *rupestris* is local: it is common along with the banded variety in many places in Dorset and Devon, on the west coast of Ireland, in crevices of rocks in the Isle of Man, and under stones at low water in the Hebrides, (E. F.).

Lovén records the *cingillus* among Scandinavian mollusca, and we have gathered the variety *rupestris* abundantly near Bergen in Norway (E. F.). The species, so far as known, is a member chiefly of the Celtic fauna, and does not range far to the south of Britain.

R. VITREA, Montagu.

Subcylindrical, smooth, white; whorls rounded, the penult turn peculiarly large; body nearly as long as the spire; suture very oblique; outer lip acute: no umbilical crevice.

Plate LXXV. fig. 5, 6.

Turbo vitreus, MONT. Test. Brit. vol. ii. p. 321, pl. 12, f. 3.—TURT. Conch. Diction. p. 202.—DILLW. Recent Shells, vol. ii. p. 838.—WOOD, Index Testac. pl. 31, f. 52.
Helix vitrea, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 213.
„ *glabrata*, MEGERLE MÜHLF. Verhand. Gesel. Nat. Berlin. vol. i. pl. 9, f. 10?
Cingula „ FLEMING, British Animals, p. 308.—Brit. Marine Conch. p. 182.
? *Rissoa punctulum*, PHILIPPI, Moll. Sicil. vol. i. p. 154, pl. 10, f. 11; from which, DESH. Lam. Anim. s. Vert. vol. viii. p. 476; changed to *glabrata*, Philippi, Moll. Sicil. vol. ii. p. 130.
Rissoa vitrea, MACGILLIV. Moll. Aberd. p. 329.—BROWN, Illust. Conch. G. B. p. 13, pl. 9, f. 81.
„ *crystallina*, BROWN, Illust. Conch. G. B. p. 13, pl. 9, f. 76?

There is a peculiarity in the look of this interesting shell which allows us to separate it, at a glance, from any known species of its genus. It is subcylindrical, but attenuated above, very thin, semitransparent, perfectly smooth, and of a shining and uniform white. Of the five and a half very convex whorls of which it is composed, the last two are so loosely coiled as almost to become disconnected from each other, and the penult, whose length is more than half its breadth, is remarkably and disproportionately large, being equal in length to the three preceding turns united. The apical whorl is obtuse, and very small. The longitudinal increase of all but the last volution is rapid. The suture is fine and very oblique. The body occupies nearly one-half of the dorsal length, but is scarcely broader than the preceding coil; it is a little produced at the base, where its declination is moderate and rounded. The mouth may be considered short, since it does not exceed the ventral length of the penult turn; it occupies from one-third, to at most two-fifths of the entire length, is subovate, not much peaked above, and is broad yet scarcely rounded at the base, where it recedes rather than advances. The peristome is continuous, and is sometimes disconnected from the body. The outer-lip is sharp-edged, moderately arcuated, and slightly disposed to expand. The pillar-lip is oblique, and, excepting where it rounds off anteriorly into the outer one, is but little arched; it is reflected, rather narrow, and of nearly equal breadth throughout; its inner edge is a little raised, but is not accompanied by any umbilical fissure. Two lines in length, and four-fifths of a line in breadth, are the dimensions of rather a large example.

This is a scarce and local species, ranging to deeper water than its near allies. Exmouth (Jeffreys and Clark) Tenby; Oxwich Bay, near Swansea, (Jeffreys); Milford Haven in twelve fathoms; off Skye in forty fathoms (M'Andrew and E. F.); Oban (Barlee); Eda Sound, &c., in Orkney, in forty fathoms (Thomas). Aberdeen coast (Macgillivray); Zetland (Fleming). Birterbuy Bay and Arran (Barlee) in Ireland.

It occurs fossil in the coralline crag (Searles Wood).

R. PROXIMA, Alder.

Resembling *vitrea,* but spirally striated.

Plate LXXV. fig. 7, 8.

Rissoa striatula (not of authors), JEFFREYS, Ann. Nat. Hist. vol. xx. p. 16.
„ *proxima*, ALDER MSS. ; THOMPSON, Ann. Nat. Hist. vol. xx. p. 174 (no description).
„ *virginea*, BROWN, Illust. Conch. G. B. p. 13, pl. 9, f. 82?

Although bearing so strong a likeness to *vitrea*, that instead of describing it at large, we need only particularize its points of dissimilarity, we cannot hesitate to assent to the perfect specific distinctness of this graceful little shell. The regular, though very minute raised lines, that densely encircle the entire surface of its larger whorls, enable us readily to distinguish a well preserved specimen from its closely allied congener; and even where an unnatural smoothness results from long attrition upon the shore, the practised eye of a conchologist will detect each individual by its more compact style of gyration. For the whorls, not being loosely coiled, as in the preceding species, are rounder and less produced, and the suture, which is profound or even subcanaliculated, is less oblique. The apex of the shell is rather more depressed, and the mouth, owing to the penult not being quite so disproportionately large, is slightly longer than the whorl above it. Its usual size is a little less than that of the last species.

This rare species has been found in Cork Harbour, Bantry Bay, Portmarnock, and Dublin Bay (Jeffreys). It is the *vitrea* of Mr. Thompson's Report on the Fauna of Ireland; he observes it has been obtained sparingly on each side of the Irish coast.

R. ? fulgida, Adams.

Very minute, oval-oblong, smooth, with spiral bands of colour that are not broken into spots; whorls only four, ventricose; apex obtuse; mouth suborbicular; pillar-lip erect; a subumbilicus.

Plate LXXXI. fig. 1, 2.

Helix fulgida, Adams, Trans. Linn. Soc. vol. iii. p. 254.
Turbo fulgidus, Mont. Test. Brit. vol. ii. p. 332.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 161.—Turt. Conch. Diction. p. 199.—Brit. Marine Conch. p. 255.
Truncatella ? fusca, Philippi, Wiegm. Archiv. Naturg. 1841, p. 54, pl. 5, f. 4; Moll. Sicil. vol. ii. p. 134, pl. 24, f. 4, probably.
Cingula fulgida, Hanl. Brit. Marine Conch. p. xliii. f. 50.
Rissoa „ Brown, Illust. Conch. G. B. p. 13.

The general aspect of this minute species reminds one of a miniature banded *Paludina*. We do not positively assert that it is the *Tr. ? fusca* of Philippi, but it bears a much greater likeness to the individuals he sent us, which are, however, larger, more coarsely wrinkled, redder, and rather more elongated, than to the delineation of his species in the "Enumeratio."

The shell is oval-oblong, thin, semitransparent, glossy, and either quite smooth or merely wrinkled with a few lines of increase. On a pale fulvous, or horn-coloured ground, the penult and ante-penult volutions are encircled by two narrow rufous zones, one near either suture, the lower one of which usually enlarges upon the body-whorl, which has a third or additional band around the extreme base. There are four whorls, of which the apical one is very short and obtuse, the last and the last but one each but moderately longer than the preceding, and all of them more or less ventricose. The penult and ante-penult turns are of moderate height, and are more perpendicular in their convexity below, more arched inward above. This difference of shelve tends to the better defining of the whorls, which are likewise separated by a profound but simple suture. The body is rather wide in proportion to its length, and is somewhat shorter than the spire; its declination is sudden, but rounded; its axis is more or less perforated. The mouth is suborbicular, and projects both laterally and basally; the peristome is continuous, but the parietal enamel is but little spread. The outer lip is simple, acute, and much arcuated both above and below. The pillar-lip is likewise arched, though in a less degree, is long, rather narrow, generally rufous, erect, and reflected. The ordinary length of our British specimens is not even two-thirds of a line.

So far as known this is a southern and western species. It has been taken at Guernsey (Barlee); Weymouth; Falmouth; Langland Bay near Swansea (Jeffreys); Torquay (S. H., Clark); Burrow Island (Rev. G. M. Beevor); Tenby (Lyons); Arran in Ireland (Barlee); Cork Harbour and Bantry Bay (Jeffreys).

R. PULCHERRIMA, Jeffreys.

Very minute, obovate-conical, umbilicated, smooth, with three or four spiral rows of spots on the body-whorl; volutions four, ventricose; spire short.

Plate LXXXV. fig. 1, 2.

Rissoa pulcherrima, JEFFREYS, Ann. Nat. Hist. (new series) vol. ii. p. 351.

This very minute shell has an obovate conical shape, is semitransparent, extremely thin, quite smooth, and of a glossy yellowish white, that is adorned with spiral rows of small and rather distant squarish spots of yellowish or reddish brown.* Of these there are two or three series upon the penult turn, and four upon the body, of which the last is not quite terminal, but lies at some distance from the extreme base, and the first two, which are usually rather nearer together than the rest, are often confluent, the spots in this event being converted, since they incline in different directions, into angulated streaks. There are only four volutions, of which the final one occupies one-half of the dorsal length. The spire is short, and ends in a rather large and very blunt apex. The smaller turns are ventricose and of moderate longitudinal increase; the body is large, extremely rounded or swollen, and broad in proportion to its length; its basal declination is sudden, but much arcuated. The suture is fine, but through the convexity of the volutions is well pronounced. The mouth, which usually occupies full three-sevenths of the entire length, is suborbicular; it is not much produced at the base, but is well rounded below. Both lips are arcuated, especially the thin and simple outer one. The pillar-lip is narrow, but is raised and reflected; behind it lies a small but distinct umbilicus. The length of the shell seldom exceeds the twentieth of an inch; the breadth is about one-third less.

A very rare and probably southern species, hitherto obtained only at the Channel Isles, where it was found by Mr. Barlee.

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* One of Adams' wretched drawings in the Linnæan Transactions reminds us a little of this species, although we do not think it at all likely that he was acquainted with the Guernsey shell. It is entitled,

Turbo scriptus, ADAMS, Trans. Linn. Soc. vol. iii. p. 65, pl. 13, f. 11, 12; from which MONT. Test. Brit. vol. ii. p. 333; MATON and RACK. Trans. Linn. Soc. vol. viii. p. 185; TURT. Conch. Diction. p. 230; FLEMING, Brit. Anim. p. 300.

R. SOLUTA.

Like *pulcherrima,* but less globose, not variegated, and with excessively minute spiral striulæ.

Plate LXXV. fig. 3, 4.

Rissoa soluta, PHILIPPI, Moll. Sicil. vol. ii. p. 130, pl. 23, f. 18 ? ?—JEFFREYS, Ann. Nat. Hist. vol. xx. p. 16.

We cannot venture to follow Mr. Jeffreys' identification of our native species with the Sicilian one, since not only is the former very different from the shell presented to us by Dr. Philippi, but the figure of the latter represents a narrower and more produced shell, with a more pointed apex, and a more produced spire. The last whorl is stated, likewise, to be almost disconnected, and the surface to be perfectly smooth. We retain provisionally the name, since in the event of the original *soluta* not proving a valid species (and we are in doubt about its claims) the present shell may assume the vacated epithet.

The shell is excessively minute, extremely thin, semi-transparent, highly lustrous, and of an uniform clear pale fulvous yellow. The shape of the few larger specimens we have seen (those with four volutions) is oval-conoid ; but the individuals more usually to be met with in cabinets (those with three and a half turns) are subglobular-conic ; the surface is smooth to the eye, and even so to a common lens, but under a glass of higher power is perceived to be regularly and densely striated in a spiral direction, which sculpture is more apparent upon the base than elsewhere. The whorls, which rise rather abruptly from the simple but profound sutural line, that divides them from each other, are rounded, yet are slightly shouldered above; their longitudinal increase is rather rapid. The spire is very short, and ends in a blunt apex; its component volutions are but little elevated. The body occupies a full half of the total length of the shell, and is ventricose and rather broad; its basal declination is well rounded, but rather sudden. The mouth, except in the young, is not quite equal in length to the part above it, but usually occupies about three-sevenths of the entire length; it is obovate, well rounded below, and a little contracted above. The outer lip is acute, arcuated, and not expanded. The pillar-lip is long, of moderate breadth, almost perpendicular, very little arched, raised, reflected, and flanked by a distinct umbilical cavity; the latter occasionally sharply defined, and rather large. The total length scarcely exceeds the twentieth of an inch, and the breadth is still less.

This shell bears much resemblance to *pulcherrima*, but is distinguished by its spiral lines; its less globular shape, the slower attenuation of its spire, and the absence of any coloured markings.

A very rare shell, but possibly more widely distributed than we at present know. Exmouth (Clark); Burrow Island (Rev. G. M. Beevor); Lamlash Bay and Bute (Bean); Cork Harbour (Jeffreys).

R. LITTOREA, Delle Chiaje.

Globular-conoid, quite smooth, of an uniform pale fulvous tint; body swollen; whorls convex; spire short; mouth occupying one-half of the entire length.

Plate LXXXI. fig. 6, 7.

Helix littorina, DELLE CHIAJE, Mem. Anim. senza Vert. Napoli, vol. iii. p. 215, pl. 49, f. 36, 37, 38.—PHILIPPI, Wiegm. Archiv. Naturg. 1841, p. 53, pl. 5, f. 7.

Rissoa ? globularis, METCALFE, Brit. Marine Conch. p. xlii. f. 87.

Truncatella littorina, PHILIPPI, Moll. Sicil. vol. ii. p. 133, pl. 24, f. 2.

The shape of this shell, which is not particularly thin, considering its minuteness, is globular-conoid; its texture is transparent; its surface of an uniform clear pale fulvous yellow, perfectly smooth, always shining, and at times iridescent. There are four gently, or but moderately shelving convex volutions, that rather quickly increase in length, and are divided by a profoundly impressed, and almost horizontal, suture, beneath which they appear marginated, but are not so in reality, the apparent line being merely the termination of the preceding volution, which, through the pellucidity of the shell is rendered visible to us. Fully one half of the entire length is occupied by the body-whorl, which is swollen, peculiarly broad, and well rounded but abrupt at its basal declination; the spire itself is short, and tapers quickly to a very obtuse apex; the axis is sub-perforated. The mouth is moderate as to size, is equal in length to the portion above it, and is of a broadly ovate form, being contracted above, and well rounded below. The outer lip, whose chief projection is towards the base of the shell, is simple, acute, and peculiarly and almost equally arcuated both above and below. The peristome is continuous, the parietal enamel of the left lip being very distinctly perceptible. The general inclination of the inner lip is obliquely subrectilinear; hence the aperture, with the subumbilicus behind the broadly reflected pillar-lip, reminds one of the genus *Natica*. Three quarters of a line is about the general length of the individuals we have examined; their breadth is a trifle less.

Discovered on the shore at Weymouth by Mr. Metcalfe.

If this be the *Helix litorina* of Della Chiaje, *Truncatella littorina* of Philippi, taken at Palermo, its position in the genus *Rissoa* is extremely questionable.

Philippi represents the animal as having a prominent emarginated muzzle, flanked by two obtuse somewhat triangular tentacles, with eyes *on* the external bases, and not on bulgings at the sides of their bases; the foot very short and rounded at the ends; the colour whitish. Such an animal certainly is much more nearly allied to *Truncatella* than to *Rissoa*. In the same volume of Wiegmann's Archiv. (vol. vii. pt. 1, 1841) Dr. Louis Pfeiffer constitutes his genus *Paludinella*. (T. minuta, ovata vel depressa; apertura ovata; peristoma simplex, subcontinuum; operculum spiratum) for Philippi's shell, and not for the *Rissoæ* of the *ulvæ* group, as the name has been cited usually.

R. ANATINA, Draparnaud.

Abbreviated ovate-conic, thin, smooth, of an uniform pale olive colour. Body at least equal to the spire; whorls ventricose, shouldered above. Suture profound. Mouth very large: pillar-lip narrow, reflected, flanked by an umbilicus.

Plate LXXXVII. fig. 3, 4.

Cyclostoma anatinum, DRAP. Moll. Terr. et Fluv. France, p. 37, pl. 1, f. 24, 25 (probably).
Paludina anatina, MICHAUD, Compl. à Drap. Moll. France, p. 100 (from last). — ALDER, Magaz. Zool. and Bot. vol. ii. p. 116.— POTIEZ and MICH. Galerie Douai, Moll. vol. i. p. 160. —DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 521 ?—GRAS, Moll. Fluv. et Terr. Isère, App. p. 20.
Littorina „ GRAY, Manual Land and F. W. Shells, p. 87.— Brit. Marine Conch. p. 258.

Neither the figure nor the description in Draparnaud's work positively demonstrates the identity of this British shell with the *anatinum* of that writer; the present shell, however, is generally accepted as the *anatinum* of authors; and the little discrepancies probably result from the rudeness of all early figures of the smaller objects of natural history, and the meagre descriptions which formerly sufficed to distinguish the few known members of a genus from their nearest congeners. The delineation of the American *P. Michaudii* in the " Galerie de Douai" (vol. i. pl. 26, f. 3, 4), harmonizes very fairly with the general look and peculiar aperture of our species, but the whorls scarcely appear so rounded, and the spire is somewhat shorter.

The shape is abbreviated ovate-conic, and the surface, when freed from the extraneous coating of dirt, with which it is generally found enveloped, is smooth and shining; the substance is thin, semitransparent, and of a greyish or tawny olive colour. The five volutions of which it is composed, are more or less shouldered or subscalariform, being horizontally compressed, and often subangulated above; below, they swell out suddenly from the strongly pronounced suture, yet are not particularly tumid in the middle. The whorls of the spire, which quickly tapers to a small and moderately pointed apex, are short, and of quick enlargement in breadth, but of rather slow longitudinal increase; the dorsal length of the penult turn is, in general, much less than the half of its breadth. The body is always at least as long as the spire, and often fills three-fifths of the entire length; it is quite as broad, or even broader than it is long, and is moderately convex and gradual in its basal declination. The extreme base is narrow, for the outline of that side of the final whorl which is opposite to the lip at first sweeps very obliquely inwards, and then, by its comparative straightness, forms an angle with the previous arch. The mouth, which is somewhat obliquely ovate, and projects at the base, occupies fully two-fifths of the entire length; it is much rounded anteriorly, and, owing to the lateral projection of the outer lip above, is not acutely peaked posteriorly. The peristome is continuous, but the parietal enamel is but thinly spread; the throat is quite smooth. The acute and simple outer lip has no tendency to expand; it is arched below, but merely convex above. The pillar-lip, which is not appressed, is long, narrow, and reflected; behind it exists a distinct umbilicus. Specimens in general measure two lines in length, and from a line and a quarter, to a line and a third in breadth.

The animal is of a grey colour marked with dark brown. Its head is rather large, with a very prominent and rather broad muzzle, which as well as the crown of the head and neck is of a dark dusky brown colour. The tentacles are long and setaceous, yellowish white, or pale grey, with a fine brown line down their centres above. Their bases are of an opaque pale yellow, and bear on the outsides of their bulgings, large, prominent black eyes. The sides are dusky grey, lineated more or less with brown. The foot is very broad, square, and obtusely angled in front, rounded behind, expanded and depressed, its caudal extremity not bearing a filament, and extending considerably beyond the ovate, short spired, simply corneous operculum. The denticles of the tongue are arranged, and resemble in form those of the typical *Rissoæ*, so as to place the generic affinities of this species beyond question, and to prove that it is not a *Littorina*, as some malacologists have considered it. Together with the two succeeding species, like its inhabitants of brackish water, it may be considered as constituting what Milne-Edwards would aptly term, a "satellite" group to the genus *Rissoa*. The names *Hydrobia* (Hartmann), *Paludestrina* (Alcide d'Orbigny), *Paludinella* (Lovén, but not Pfeiffer), and *Litorinella* (Braun), have been severally applied to this group, more on surmise of its peculiarities than through precise distinguishing of its characters.

We owe our opportunity of examining the animal to Mr. Pickering, a gentleman well versed in the terrestrial and fluviatile Mollusca of Britain. It is found, but is rare, in the brackish waters of the marshes near Greenwich. Draparnaud described it as a French species.

An obscure species, whose described characters are not so very unlike those of *anatina*, is only known to us as the

Turbo subumbilicatus, MONT. Test. Brit. vol. ii. p. 316.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 165.—RACK. Dorset Catalog. p. 50.—Turt. Conch. Diction. p. 204.—DILLW. Recent Shells, vol. ii. p. 841.
Cingula subumbilicata, Brit. Marine Conch. p. 181.
Rissoa „ BROWN, Illust. Conch. G. B. p. 12.

All the authors cited above have manifestly drawn their descriptions of this very doubtful species from the pages of Montagu. Rackett and Brown have, in addition, both figured shells which they supposed to be identical with it. The delineation in the "Dorset Catalogue" is so small and rudely executed (pl. 18, f. 12, b), that we cannot determine what species was intended by it; possibly *ulvæ, var. stagnalis*. Brown's figure (Ill. Conch. G. B. pl. 9, f. 44), though larger, is, like nearly all his other magnified representations, very inadequate; it bears some resemblance to an abbreviated form of *ventrosa*.

The *Cingula subumbilicata* of Fleming is quite a different thing, and evidently not copied from Montagu; for he remarks that it is common about the roots of Fuci, and declares it to be greenish grey, with from five to seven whorls, instead of yellowish white, with but four or five volutions. The *R. subumbilicata* of Berkeley, again, is not represented in the engraving as having the few and tumid whorls of Montagu's shell, but as composed of several flattish or plano-convex volutions.

"A smooth, subglossy, conic, yellowish-white shell; volutions four or five, very tumid, the first occupying above half the shell: apex rather obtuse: aperture oval: outer lip even: inner lip a little reflexed, forming a sulcus or subumbilicus. Length one-eighth of an inch; breadth one-half its length." Montagu further adds, that it differs from *ulvæ* in being smaller, more ventricose, and more umbilicated; by its aperture, and the greater tumidity of its volutions; from *ventrosa*, by its superior size, its greater breadth at the base, and its exactly ovate aperture, which is not contracted into an acute angle posteriorly as in the above-mentioned species. Mr. Bryer, who has caused the introduction of so many exotic shells into our Fauna, is stated to have found it on the shore at Weymouth.

R. VENTROSA, Montagu.

Elongated, smooth, lustrous, transparent, of an uniform olivaceous tint, never pure white (when recent): whorls ventricose, not shouldered, nor abruptly enlarging: outer lip not patulous.

Plate LXXXVII. fig. 1, 5, 6, 7.

SCHRÖTER, Flüssconch. pl. 8, f. 7 ?

Turbo ventrosus, MONT. Test. Brit. vol. ii. p. 317, pl. 12, f. 13. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 164. — RACK. Dorset Catalog. p. 49, pl. 18, f. 12, a.

Cyclostoma acutum, DRAPARN. Moll. France, p. 40, pl. 1, f. 23 (probably), from which *Paludina acuta*, MICH. Comp. à Drap. p. 100; POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 244; DESH. Anim. s. Vert. vol. viii. p. 521; GRAS, Moll. Isére, App. p. 20.

Turbo ventricosus, DILLW. Recent Shells, vol. ii. p. 840.—WOOD, Index Testac. pl. 31, f. 59.

Paludina octona, NILSSON, Moll. Sueciæ, p. 92 ?

Cingula ventricosa, FLEMING, Brit. Animals, p. 307. — Brit. Marine Conch. p. 180.

Paludina stagnorum, TURT. Manual Land and F. W. Shells, p. 136, f. 123.— GRAY, Manual L. and F. W. Shells, p. 95.

„ *muriatica*, DESH. Encyclop. Méth. Vers. vol. iii. p. 693 (probably).

Cingula minuta, GOULD, Invert. Massach. p. 265, f. 171 ?

Rissoa ventricosa, MACG. Moll. Aberd. p. 148.—BROWN, Illust. Conch. G. B. p. 12, pl. 8, f. 27.

Our reference to continental synonyms for this species is purposely limited. The *P. muriatica* of Lamarck, and the *Turbo thermalis* and *Helix octona* of Linnæus are often regarded as the original names of the few foreign shells above cited. They are too obscurely defined to insure identification.

This shell is thin, smooth, shining, and of a pellucid horn-colour, which has usually a tinge of olivaceous green or fulvous yellow. The shape ranges from oblong-conic to oblong-turreted, and is composed of six (more rarely five) much rounded volutions, that are divided by a simple but profoundly impressed, rather oblique suture, and terminate in a small moderately pointed apex. Their longitudinal increase is gradual, and in the medium shaped specimens they are of moderate length, that is to say the penult turn is rather more than twice as broad as it is long; the more abbreviated is the general form, the shorter of course become the whorls, and *vice versâ:* in the more characteristic examples, the swell of each volution is all but symmetrical, that is to say, equal in extent both above and below. The body, which occupies from one-third to two-fifths of the entire length, is well and more or less abruptly rounded at its basal declination. The spire (viewed ventrally) is always half as long again as the mouth, and more frequently about twice its length. The aperture, whose well rounded anterior termination is rather below the basal level of the body-whorl, has an ovate or rounded ovate figure, and is not distinguished by any peculiar colouring; its posterior contraction is rather slight, and not acute. The peristome is continuous or very nearly so, and is at times almost detached. The outer lip is simple, acute, and semicircular; it does not expand, neither does it recede nor advance in any perceptible degree towards the base, near which the swell is most marked. The arcuation of the inner lip is much inferior to that of the outer one; the pillar occupies a considerable portion of it. The columellar lip is thin, narrow, raised at the edge, curved and reflected; there is a more or less distinct hollow or umbilical crevice. The throat, as is usual in this section, is quite smooth. Our larger specimens are nearly a quarter of an inch long.*

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* It is possible that the *Turbo disjunctus*, described by Montagu, and figured by Laskey, who picked it up on Belton sands, near Dunbar, was only a loosely coiled specimen of this or some other well known species. The magnified

The smaller variety (pl. LXXXVII. f. 7), usually termed *muriatica** by collectors, is shorter, is composed in general of only five whorls and a half, is more intense in colouring, and has its volutions somewhat shouldered, their swell being much more perpendicular below, and a little horizontally flattened above. The continuity of the peristome is scarcely perfect; and the principal swell of the outer lip, which is not so broadly rounded at the base, is near the middle.

Not so common as *ulvæ* and apparently of more marine habits, though found in not a few brackish water localities.

Laugharne (Lyons); near Swansea (Jeffreys); Cullercoats from sand and sea-weeds, very rare (Alder).

It is found in many localities in the west of Europe.

We have figured Mr. Bean's unique example of his *R. pellucida* (Brit. Marine Conch. p. xliii. f. 39) and must record the liberal spirit which induced him, in his love of

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drawing agrees fairly enough with *ventrosa;* the shape, however, in the minute natural-sized delineations, is represented as decidedly more cylindrical. In the absence of the original example (perhaps after all an exotic shell), we can merely copy, like our predecessors, the characters mentioned in the "Testacea Britannica."

Turbo disjunctus, Mont. Test. Brit. Suppl. p. 128.—Laskey, Mem. Werner. Soc. vol. i. pl. 8, f. 3.—Turt. Conch. Diction. p. 219.
Cingula disjuncta, Fleming, Brit. Anim. p. 307.—Brit. Marine Conch. p. 178.
Rissoa ,, Brown, Illust. Conch. G. B. p. 12, pl. 9, f. 7.

Rather slender, white, perfectly smooth, with six remarkably rounded volutions divided by a broad deep suture, the bottom of which is flat or concave, not angular as in most other shells, giving the whorls somewhat the appearance of being disunited, aperture nearly orbicular; pillar-lip reflected, behind it an umbilicus. Length scarcely a quarter of an inch.

* Not that of Macgillivray, Moll. Aberd. p. 148, copied as *Cingula* (*Littorina*) *muriatica*, Brit. Marine Conch. p. 261, xxxix. which Mr. Jeffreys informs us, after examining the types, was constituted from a worn specimen of what Mr. Alder once proposed to call *tenuisculpta* (regarded by us as a smooth aberrant form of *parva*).

science, to risk again his fragile treasure, after it had already been injured by a previous transmission. Upon close comparison of it with an adequate suite of the present very variable species, we believe it to be only an aberrant colourless variety of *ventrosa*, since we are unable to detect any further characters, beyond the snowy whiteness of its hue, by which we may distinguish the two shells.

R. ULVÆ, Pennant?

Smooth, tawny, not variegated, more or less opaque and strong, not much polished. Whorls flattened. Outer lip simple, not patulous; pillar-lip reflected and rather broad.

Plate LXXXI. fig. 4, 5, 8, 9; Plate LXXXVII. f. 2, 8; and (Animal) Plate J. J. fig. 8.

Turbo ulvæ, PENNANT, Brit. Zool. ed. 4, vol. iv. p. 132 (probably), pl. 86, f. 120?—DA COSTA, Brit. Conch. p. 105.—MONT. Test. Brit. vol. ii. p. 318.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 164.—RACK. Dorset Catalog. p. 49, pl. 18, f. 12.—TURT. Conch. Diction. p. 204.—DILLW. Recent Shells, vol. ii. p. 840.—WOOD, Index Testaceolog. pl. 31, f. 58.

Helix „ PULTENEY, Hutchins, Hist. Dorset, p. 49.

„ *Jeverana*, MEGERLE MÜHLF. Verh. Gesel. Nat. Berlin. vol. i. pt. 4, p. 215, pl. 8, f. 5 (probably).

Cingula ulvæ, FLEMING, Brit. Animals, p. 308.—Brit. Marine Conch. p. 180.

Rissoa subumbilicata, BERKELEY, Zoolog. Journ. vol. v. p. 430, pl. 19, f. 5 (probably).—MACGIL. Moll. Aberd. p. 342, (probably).

Paludina ulvæ, FORBES, Malac. Monensis, p. 18.

Littorina „ JOHNSTON, Berwick. Club, vol. i. p. 269 (with animal).—Brit. Marine Conch. p. xxxix. f. 88.

Rissoa Barleei, JEFFR. Ann. Nat. Hist. vol. xix. p. 310.

This species, in its ordinary condition, ranges in shape from oblong-conic to turreted-conic; it is, however, liable to a kind of distortion, by which the body-whorl is occasionally relaxed from its symmetrical embrace of the preceding turn, the suture bends down, the mouth projects, and the spire is narrow and produced. It is strong, and more or less opaque, dull-surfaced, smooth, and of an uniform tint of dirty fulvous or pale yellowish olive colour. The spire tapers rather quickly to a somewhat pointed apex, and is composed of six whorls, which are so flat in the more characteristic examples, that the lateral outlines are almost rectilinear. The volutions are moderate both as to length and celerity of longitudinal increase, and are sometimes bordered by a paler line beneath the narrow simple and not much slanting sutural line that divides them from each other. The body occupies from about two-fifths to nearly half the dorsal length; its basal slope is often subangulated at the commencement, and is not rounded, but more or less flattened. The mouth, which is smooth internally, and has a shortened ovate contour, is little more than half the length of the spire above it; its posterior contraction is not particularly acute. The peristome is white, and distinctly continuous. The outer lip, which does not advance at the base, is simple, acute, and not disposed to expand; it is arched in front, and straightish or merely convex posteriorly. The upper or posterior portion of the inner lip is straightish, and much slanting. The pillar-lip is rather broad, and owing to the projection of the extreme base of the body is tolerably long; although flattened, it is not appressed, but is usually raised a little at the edge. It is reflected, but is not succeeded by any real umbilicus, although a subumbilical crevice is generally present. The common dimensions are the ninth of an inch for the breadth, and a quarter of an inch for the length; but individuals of certain localities much exceed these proportions.

The variety *stagnalis* (Brown, Illust. Conch. G. B. pl. 9, f. 9), which is usually termed *subumbilicata* by collectors, but does not agree with Montagu's description of that species (pl. LXXXVII. f. 8), is smaller and shorter than the typical form, is of a clearer fulvous hue, and displays rather more convexity in the whorls, basal declination, and general outline. The mouth is longer and narrower; its posterior contraction is consequently more acute and gradual. The outer lip is but little prominent, and the reflection of the inner one is narrower than usual. Professor Bronn, of Heidelberg, sent us similar shells as the *Paludina stagnalis* of Menke (Zeitsch. Malakozool. 1845, p. 37), stating that they had been forwarded to him from Norderney through that author.

We have regarded the *R. Barleei* (pl. LXXXI. f. 8, 9) as only a deep-water form of this most variable species, since the peculiar characteristics which distinguish the more strongly marked examples are not present in all the individuals taken on the same spot, but merge perceptibly, in certain of them, into the ordinary features of *ulvæ* proper. The more singular specimens are decidedly more cylindraceous than in the typical or shore variety, have the apex usually eroded, and display a remarkable contraction in the size of the aperture, not so much as to the relative proportions of height between it and the spire (the latter, however, is occasionally thrice as long as the former) as in the very small proportion of the entire area of the shell that is occupied by it. We received a similar shell from Professor Lovén, of Stockholm, as the *Paludina Balthica* of Nilsson (Moll. Sueciæ, p. 91). A small variety is taken in Torbay, which is narrower than usual, and has for the most part only a third of the ventral length occupied by the mouth; the apex is occasionally rufous. We have likewise taken in the Channel Islands (S. H.) a few specimens that were almost cylindrical in the middle, the penult and antepenult turns being of nearly the same breadth; in these (perhaps distorted) individuals, the mouth was remarkably projecting.

The animal varies in colour from a dull translucent white through every shade of dusky to nearly black. The muzzle is large, rather quadrate, subbilobated in front; it is often marked with three dark longitudinal lines and is margined with defined black. The tentacles are long and setaceous, of a dull white or yellowish hue, with a black spot or bar at a short distance from their extremities; the eyes are large, black, and prominent on bulgings at the exterior bases of the tentacula. The foot is squarish, angled obtusely in form, rounded posteriorly (and, according to Mr. Clark, sometimes emarginated); the caudal part extends considerably behind the operculum. The caudal filament is aborted. The above description, which will be found to agree in all essential points with those published by Mr. Berkeley and Mr. Clark, was drawn up from specimens gathered at Glengariff in the south of Ireland.

"These animals," observes Mr. Clark, "creep with great rapidity, and float with the foot uppermost by means of a hydrostatic apparatus, as air-bubbles are seen continually to proceed from the aperture; they are strictly littoral, and inhabit in myriads the green oozes of estuaries." *

This common Mollusk is found in all brackish water, and estuary localities between tide marks round the British Isles, where it is a favourite food of water-birds.

The *Rissoa Barleei* appears to be undistinguishable though found in so different a locality, having been dredged by Mr. Barlee and Mr. Jeffreys in twenty to forty fathoms, Loch Carron and Skye.

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* Annals of Natural History for May, 1850, p. 358.

It occurs fossil in the coralline crag of Gedgrave (Searles Wood), and is found all round the European coasts.

Note.—To this genus belong, apparently, a number of shells, which, from the rudeness of their delineation, and the extreme brevity of their descriptions, have baffled the efforts of naturalists to recognize them. Such are the following:—

Turbo subrufus, ADAMS, Trans. Linn. Soc. vol. v. p. 3, pl. 1, f. 18, 19, from which MONT. Test. Brit. vol. ii. p. 334; MATON and RACK. Trans. Linn. Soc. vol. viii. p. 185; TURT. Conch. Diction. p. 230; FLEMING, Brit. Animals, p. 300; *Rissoa subrufa*, BROWN, Ill. Conch. G. B. p. 12, pl. 9, f. 13.

Supposed by Mr. Jeffreys to be possibly a form of *parva* var. *interrupta*; it seems to us, however, much more like *R. rubra.*

Turbo strigatus, ADAMS, Microsc. pl. 14, f. 16.—MONT. Test. Brit. vol. ii. p. 331. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 186.— TURT. Conch. Diction. p. 229. — FLEMING, Brit. Animals, p. 300. — *Rissoa strigata*, BROWN, Ill. Conch. G. B. p. 12, pl. 9, f. 8.

Wholly derived from Walker's "Testacea Minuta," fig. 38. Supposed by some to be the fry of *R. striatula.*

Turbo retiformis, MONT. Test. Brit. vol. ii. p. 330.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 186.—TURT. Conch. Diction. p. 229.— *Rissoa retiformis*, BROWN, Ill. Conch. G. B. p. 12, pl. 8, f. 3, 23.

Solely derived from Walker's "Testacea Minuta," fig. 37. Supposed by some to be the fry of *R. punctura.*

Helix variegata, ADAMS, Trans. Linn. Soc. vol. iii. p. 67, from which MONT. Test. Brit. vol. ii. p. 446; MATON and RACK. Trans. Linn. Soc. vol. viii. p. 204; *Turbo variegatus*, FLEMING, Brit. Anim. p. 301; *Spira ? variegata*, BROWN, Ill. Conch. G. B. p. 20.

Agrees fairly with the lineated variety of *labiosa*, but has only four whorls; is usually considered a variety of *inconspicua*, but might also be the fry of almost any of the *parva* section of this genus.

Turbo elegans, ADAMS, Trans. Linn. Soc. vol. iii. pl. 13, f. 31, 32; from which MONT. Test. Brit. p. 333; *Turbo Adamsii*, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 185; TURT. Conch. Diction. p. 230; *R. Adamsii*, BROWN, Illust. Conch. G. B. p. 11, pl. 9, f. 20, and *R. elegans*, p. 13.

The figure reminds one slightly of *R. costata*, and the scanty description is not adverse to the conjecture.

Turbo carinatulus, ADAMS, Microsc. pl. 14, f. 18. — MONT. Test. Brit. vol. ii. p. 331. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 186.—TURT. Conch. Diction. p. 229. — *Turritella carinatula*, FLEMING, Brit. Animals, p. 304.—*Rissoa carinatula*, BROWN, Illust. Conch. G. B. p. 11, pl. 9, f. 67.

All derived from figure 44 of Walker's "Testacea Minuta." Mr. Jeffreys thinks this may probably be a form of *R. labiosa*.

The following *Rissoæ* are figured in Brown's "Illustrations of the Recent Conchology of Great Britain and Ireland;" but, from the imperfection of the magnified representations of the more minute species in that work, we have not been able to recognize them.

R. Binghami, p. 10, pl. 9, f. 29. — Has the general aspect of *R. Montagui*, of Payraudeau. Of the known British Shells, *R. inconspicua*, perhaps, comes nearest to its description.

R. obtusa, p. 10, pl. 9, f. 27, 28.—Has the general aspect of *R. Zetlandica*.

R. lactea, p. 11, pl. 9, f. 77.—Allied to *R. Bryerea*. Exotic?

R. sulcata, p. 10, pl. 9, f. 69.

R. candida, p. 11, pl. 9, f. 75.—Somewhat allied to *R. Bryerea*. Exotic?

R. turricula, p. 10, pl. 9, f. 18.—Not like any of our known shells. Exotic?

R. vittata, p. 15, pl. 8, f. 29.—Slightly resembles the var. *fasciata* of *R. parva*.

SPURIOUS.

R. BRUGIERI, Payraudeau.

Strombus reticulatus, MEGERLE VON MÜHL. Verhand. Berlin. Gesel. Nat. (1824) vol. i. p. 27, pl. 8, f. 1.

Rissoa Brugieri, PAYRAUD. Moll. Corse, p. 113, pl. 5, f. 17, 18. — POTIEZ and MICH. Galerie Douai, Moll. vol. i. p. 266. — DESH. Lam. Anim. s. Vert. vol. viii. p. 483.—PHILIPPI, Moll. Sicil. vol. ii. p. 130.

„ *decussata*, MENKE, Synops. Mollusc. (no description.)

Cingula Brugieri, Brit. Marine Conch. p. xli. fig. 38.

A Mediterranean shell; introduced, in the British Marine Conchology, as probably taken at Scarborough. The specimen was forwarded as British by Mr. Bean, who, it appears, had received it as from the Channel Islands, and sent it as the traditional Turbo coniferus *of Montagu. Its identity with that shell is likewise asserted by Professor Forbes, in his account of the Egean Invertebrata.*

Turbo coniferus, Mont. Test. Brit. vol. ii. p. 314, pl. 15, f. 2. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 173.—Rack. Dorset Catalog. p. 50, pl. 19, f. 6.—Turt. Conch. Diction. p. 213.—Dillw. Recent Shells, vol. ii. p. 858. — Wood, Index Testac. pl. 31, f. 103.

Cingula conifera, Fleming, Brit. Animals, p. 306.

Turritella „ British Marine Conch. p. 176.

Rissoa „ Brown, Illust. Conch. G. B. p. 10, pl. 9, f. 68.

The descriptions of this shell are all derived from the same source, the "Testacea Britannica," unless, perhaps, that in the "Dorset Catalogue;" the figures, too, are all copied from the same work, except that of Brown, which seems original, and more like *Brugieri*, but does not represent the basal canal of its aperture. Montagu's figure, if intended for the Mediterranean species, is a very bad representation of it; his description fairly enough agrees, except that "cavities" would be an exaggerated expression for the slight sutural indentations that result from the posterior projection of the longitudinal costæ.

"A strong, taper, white shell, with six volutions terminating in rather an obtuse point, and furnished with about twelve undulated ribs, interrupted only by a fine separating line; the interstices between them, at the top of each volution, are formed into small cavities, giving that part a scalloped or denticulated appearance; these singular indentations continue throughout the spiral divisional line; the ribs are crossed by extremely fine, close-set striæ, not discernible without the assistance of a lens: aperture oval, oblique, strongly marginated: pillar-lip not reflected. Length a quarter of an inch; breadth one-third its length. This very elegant shell we were favoured with by Mr. Bryer, who found it at Weymouth."

R. DECUSSATA, Montagu.

Helix decussata, Mont. Test. Brit. vol. ii. p. 399; Suppl. pl. 15, f. 7. — Rack. Dorset Catalog. p. 55, pl. 19, f. 17.

Turbo arenarius, Maton and Rack. Trans. Linn. Soc. vol. viii. p. 209.—Turt. Conch. Diction. p. 210.

„ *decussatus*, Dillw. Recent Shells, vol. ii. p. 882.

Phasianella decussata, Fleming, Brit. Animals, p. 302.

Rissoa alata, Menke, Synopsis Mollusc. (ed. 2) p. 138 (from description).

„ *deformis*, Sowerby, Genera Shells, Ris. f. 2; from which Reeve Conch. Systemat. vol. ii. pl. 208, f. 2?

Eulima decussata, Brit. Marine Conch. p. 187.—MACGIL. Moll. Aberd. p. 343?
Rissoa pyramidilla, BROWN, Illust. Conch. G. B. p. 11, pl. 9, f. 63.

A common W. Indian shell; introduced by Montagu as taken on the Dorset coast by Mr. Bryer. Its solid and porcelain white structure, its flattened surface, the sublobated basal advance of the outer lip, and the effuse or subcanaliculated anterior extremity of the aperture below the pillar, render it very unlike our native Rissoæ. *We have never seen any examples in which the apex was not truncated.*

R. AURISCALPIUM, Linnæus.

Turbo auriscalpium, LINN. Syst. Nat. ed. 12, p. 1240.
Turritella „ Bosc, Hist. Nat. Coquilles, vol. iv. p. 82.
Turbo marginatus, MONT. Test. Brit. Suppl. p. 128. — LASKEY, Mem. Werner. Soc. vol. i. pl. 8, f. 13.—TURT. Conch. Diction. p. 213.—WOOD, Index Testaceolog. pl. 31, f. 105.
„ *arcuatus*, DILLW. Recent Shells, vol. ii. p. 859.
Rissoa acicula, RISSO, Hist. Nat. l'Europe Mérid. vol. iv. p. 121, f. 60?—SOWERBY, Genera Shells, Riss. f. 4; from which, REEVE, Conch. System. pl. 208, f. 4?
„ *acuta*, DESMAR. Nouv. Bullet. Soc. Philomat. Paris, 1814, p. 8, pl. 1, f. 4.—BLAINV. Man. Malac. pl. 35, f. 6 (badly).—DESH. Encycl. Méth. vol. iii. p. 889; LAM. Anim. s. Vert. vol. viii. p. 470. — PHILIPPI, Moll. Sicil. vol. i. p. 151. — PAYRAUDEAU, Cat. Moll. Corse, p. 110. — POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 266.
Cingula marginata, FLEMING, Brit. Anim. p. 306.—Brit. Marine Conch. p. 176.
Rissoa auriscalpium, MENKE, Synopsis Mollusc. (ed. 2), p. 44 (identification only).—PHILIPPI, Moll. Sicil. vol. ii. p. 125.
„ *marginata*, BROWN, Illust. Conch. G. B. p. 11, 13, pl. 9, f. 23, 24, 83.

A Mediterranean shell; introduced by Montagu as taken by Laskey near Dunbar.

R. CALATHISCUS, Montagu.

Turbo cimex, LINN. Syst. Nat. ed. 12, p. 1233, from types.
„ *calathiscus*, MONT. Test. Brit. Suppl. p. 132 (not var.), pl. 30, f. 5.—TURT. Conch. Diction. p. 211. — DILLW. Recent Shells, vol. ii. p. 821.—WOOD, Index Test. pl. 30, f. 16.
Alvania Europæa and *mamillata*, RISSO, Hist. Nat. Europe, Mér. vol. iv. f. 116, 128.

Alvania Freminvillea, Risso, H. N. Europe Mér. vol. iv. p. 141, f. 118 ?
Rissoa cancellata, Desm. Bullet. Soc. Philomat. Paris, 1814, pl. 1, f. 5 ?—Payraud. Cat. Moll. Corse, p. 111.—Potiez and Mich. Galerie de Douai, vol. i. p. 267. — Desh. Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 464.
Cingula calathiscus, Fleming, Brit. Animals, p. 305. — Brit. Marine Conch. p. 174.
Rissoa granulata, Philippi, Moll. Sicil. vol. i. p. 153.
„ *calathisca*, Brown, Illust. Conch. G. B. p. 10, pl. 9, f. 4.

A Mediterranean shell; figured by Montagu, as taken by Laskey at Jura.

Although we know it to be the cimex *of Linnæus, we hesitate to adopt his name, as neither his description, nor the figures he cited, adequately indicate what species he intended.*

R. Bryerea, Montagu.

Turbo Bryereus, Mont. Test. Brit. p. 313, pl. 15, f. 8; Suppl. p. 124.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 172. — Rack. Dorset Catalog. p. 50, pl. 19, f. 7. — Turt. Conch. Diction. p. 214. — Dillw. Recent Shells, vol. ii. p. 858. — Wood, Index Testaceolog. pl. 31, f. 102.
„ *costatus*, Donov. Brit. Shells, vol. v. pl. 178, f. 3.
Cingula Bryerea, Fleming, Brit. Animals, p. 307.—Brit. Marine Conch. p. 178.
Rissoa Chesnelii, Michaud, Nouv. Esp. de Riss. p. 17, f. 23, 24; Desh. Anim. s. Vert. vol. viii. p. 483, probably.
„ *Bryerea*, Macgilliv. Moll. Aberdeenshire, p. 341. — Brown, Illust. Conch. G. B. p. 11, pl. 9, f. 78.
Nassa Bryerii, Brown, Illust. Conch. G. B. p. 5 (not figured).

A well-known West Indian species, introduced by Montagu as taken by Laskey at Weymouth. Deshayes' description of R. pusilla *(Anim. s. Vert. vol. viii. p. 479) agrees with it in most particulars. The variety with ten or twelve, instead of seventeen or eighteen, ribs, alluded to by Montagu, and referred to by succeeding copyists, is not improbably a distinct species.*

R. denticulata, Montagu.

Turbo denticulatus, Mont. Test. Brit. p. 315.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 173. — Turt. Conch. Diction. p. 213. — Dillw. Recent Shells, vol. ii. p. 859. — Wood, Index Testaceolog. pl. 31, f. 104.

Cingula denticulata, FLEMING, Brit. Anim. p. 306.—Brit. Marine Conch. p. 771.
Rissoa ,, BROWN, Illust. Conch. G. B. p. 11 (pl. 9, f. 80 ?).

A conic, subpellucid, white shell, with six volutions terminating in an obtuse point, furnished with nine or ten coarse ribs, that project at the top of each spire, forming strong indentations like the preceding species (*conifera*); aperture suborbicular, outer lip thickened by a rib; pillar-lip smooth, indented with one or two small tubercles at the base adjoining the ribs. Length not quite a quarter of an inch; breadth one-half its length.

Supposed to be exotic, but is not known to us. Stated to have been received by Montagu from Weymouth (that once prolific source of spuriously native species), along with conifera, *and to bear much general likeness to that shell, yet to differ from it by its more conic shape, its fewer and stronger ribs, which form deeper sutural denticulations, are not undulated but simply oblique, and are separated by smooth intervals; and by its more orbicular, and not truly marginated but simply thickened aperture. The various descriptions of this shell appear to be derived from the original one in the "Testacea Britannica," but both Wood and Brown have delineated a shell under this appellation. The minuteness of the scale on which the former has exhibited the species is an effectual bar to the recognition of the object intended; the other engraving referred to displays a shell that seems allied most closely to* Brycrea, *but is shorter and less closely ribbed, and agrees very fairly with a Jamaica species called* subangulata *by our friend, Professor Adams, in his correspondence. The tubercles upon the pillar referred to by Montagu are neither present in that shell, nor delineated in Brown's engraving: hence we dare not assert the identity of the figured specimen with Montagu's lost type.*

JEFFREYSIA. Alder.

"Shell spiral, conical or subglobose, thin, transparent; aperture ovate, rounded below, with the peristome thin and entire. Operculum horny, thin, imperfectly ovate, nearly straight on one side; not spiral, but showing faint concentric lines of growth from a lateral nucleus. It is strengthened internally, on the side next the columella of the shell, by a rib with a branch towards the centre of the operculum: from this rib rises a strong projecting plate, set at right angles to the opercular disc.

"Animal with four flattish tentacles; the upper pair moderately long, the lower pair rather shorter, and spreading out broad at the base so as to unite with the outline of the head. Eyes placed on the back of the animal, a considerable distance behind the tentacles. They are large and prominent. Operculigerous lobe small and rounded, without filaments or prolonged appendages. Foot oblong, notched and bilobed in front, with a groove down the centre, and slightly rounded behind. The armature of the tongue consists of a broad crenulated central tooth, flanked by two lateral ones on each side:—the first broad and crenulated, the exterior one small and hooked.

"There is no character in the shell of this curious genus by which it can be distinguished from *Rissoa*. In the only two species yet known, both minute, the shell is transparent, and from the remarkable position of the eyes of the animal, so far behind the usual place, and constantly within the shell, its transparency is probably a constant character of the genus, being necessary for the exercise of vision. The lower tentacles may be considered to represent the lobes of the muzzle in *Rissoa*, here elongated into tentacles, and covered with vibratile cilia in the same manner with the upper pair: these latter are more flattened and broader than in *Rissoa*.

"The operculum is very peculiar. The projecting internal plate I do not recollect to have observed in any other genus, though the spine in *Nerita* approaches to it. It appears from the ridges on its inner surface to afford attachment to a muscle.

"*Jeffreysia* is a littoral genus, found in company with *Rissoa* on small sea-weeds in pools between tide-marks. Its alliance is evidently with that genus, which in the shell, it so strongly resembles; and the lingual armature bears out the affinity, differing but little from that of *Rissoa interrupta* and some of the commoner species. Some others of the small transparent shells usually included under *Rissoa*, may probably, when they are obtained alive or with the operculum, be found to belong to this genus."* ALDER, in Litt.

J. DIAPHANA, Alder.

Oblong conic; whorls at least four; body less than the spire.

Plate LXXVI. fig. 1.

Rissoa glabra, BROWN, Illust. Conch. G. B. p. 13, pl. 9, f. 37?
Rissoa ? glabra, ALDER, Ann. Nat. Hist. vol. xiii. p. 325, pl. 8, f. 1, 2, 3, 4.
,, *diaphana*, ALDER, Cat. Moll. Northumb. and Durh. p. 55.

The name *glabra* was applied to this species by Mr. Alder, under the impression, that what he had previously noticed as *R. albella* at the Cork Meeting of the British Association,—by which designation it is enumerated in Mr. Thompson's valuable list of Irish Invertebrata (Report Brit. Assoc. 1843)—was identical with the *glabra* of Brown's "Illustrations."

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* This account of a most interesting and distinct new genus has been entirely communicated by our valued friend Mr. Alder.

The shell is extremely thin, diaphanous, quite smooth, of an uniform lustrous snowy white, and of an oblong-conic shape. There are only four to four and a half volutions, the posterior one of which is dome-shaped. The body, whose basal declination is much rounded and rather quick, only occupies from two-fifths to three-sevenths of the dorsal length, but viewed from below is equal to the spire; the latter is moderately attenuated, yet rather broadly rounded at its apex. The suture is fine and a little oblique, but the whorls being decidedly ventricose, are well defined; they are moderately high, that is to say are half as long as broad. From three to four are visible above the mouth; their longitudinal increase is moderate, the penult not being disproportionately larger than the preceding turn. The aperture occupies two-fifths, or rather more, of the total length: it is of a somewhat ovate figure, slightly contracted above, and well rounded below, where it is produced a little beyond the basal level; the throat is quite smooth. The peristome is continuous, but owing to the thinness of the shelly matter, is not distinctly so. The outer lip is acute, simply arcuated, and moderately projecting; it has no tendency to expand. The inner lip is very narrow, erect, slightly reflected and sinuated, being more oblique above and somewhat perpendicularly subarcuated below; behind it exists a slight subumbilical chink, which is much more apparent in the immature examples. The operculum is very thin and pale; its nucleus is lateral, and near the pillar. The length of the shell is about twice its breadth, yet is rarely three-fourths of a single line.

"The animal is pale yellow with three longitudinal bands of rich brown on the body, and blotches of the same colour on the cloak, which, seen through the transparent shell in a fresh state, may readily be mistaken for markings on the latter. The other characters of the animal are those of the genus of which it constitutes the type."—ALDER.

It was discovered by Mr. Alder and communicated by him to the British Association at Cork in 1843. He found it on small sea-weeds in pools at Dalkey Island, near Dublin, and at Cullercoats, Northumberland. It has been taken, also, in the Channel Isles by Mr. Barlee, who has also found it at Arran Isles, County Galway, at Staffa, and at Lerwick. Mr. Jeffreys has taken it at Langland Bay, near Swansea.

J. OPALINA, Jeffreys.

Subglobose, of three whorls only; body greatly longer than the spire.

Plate LXXVI. fig. 3, 4.

Rissoa? opalina, JEFFREYS, Ann. Nat. Hist. (new series) vol. ii. p. 351.

Although so minute, and composed of so few volutions, this little shell presents the aspect of maturity.

It is of a globosely oval form, is extremely thin, diaphanous, perfectly smooth, and of a peculiarly shining, and sometimes iridescent, uniform brownish white. There are but three whorls, of which the first is moderately large and bluntly mamillary; the second very convex or even ventricose, but much shelving, and more than twice as broad as it is long. The body or final whorl is nearly twice as long as the spire ; it is ventricose, and swells out at once from under the fine but well marked suture ; its basal declination is more or less abruptly rounded. The moderately projecting mouth is elongated, and occupies four-sevenths of the total length ; it is of a somewhat narrow and rather obliquely subovate form, gradually contracted posteriorly, and broadly rounded anteriorly, where it is a little produced and disposed to expand. The peristome is continuous, but ill-defined. The outer lip is sharp-edged, and continuously and broadly arcuated. The pillar-lip is long, straightish, and thickened ; it is not detached from the pillar ; the surface is a little concave or flattened towards the base, which is rendered more apparent by its contrast to the subsequent tumidity of the body-whorl. The axis is distinctly perforated by a narrow umbilicus. The operculum is yellow ; its nucleus is lateral, and adjacent to the pillar ; its increase is concentric. The length of the shell, which exceeds its breadth, is merely the twentieth of an inch.

" The animal has not been observed in a living state, but the singular operculum, similar to that of *J. diaphana*, shows that it belongs to this genus."—ALDER.

Channel Isles (Barlee).

SKENEA, FLEMING.

Shell orbicular, spiral, depressed, or discoid, with few volutions, deeply umbilicated below. Peritreme entire, continuous, circular, slightly disconnected from the body whorl. Operculum corneous, of few whorls.

Animal with a muzzle-shaped head flanked by two subulate tentacles bearing the eyes on bulgings at their external bases. Foot rather short, oblong, rounded at both ends; operculigerous lobe with rudimentary lateral wings, and furnished posteriorly with an obscure rudimentary cirrhus.

This genus was established by Dr. Fleming for the *Helix depressa* of Montagu, and some apparently allied shells, and was dedicated by him to the memory of Dr. Skene, of Aberdeen, a Scottish naturalist of eminence in the time of Linnæus. It is synonymous with the *Delphinoidea* of Brown. The *Skeneæ* may be said to be discoid *Rissoæ*. The only one of the following shells which unquestionably should retain this generic appellation is the *S. planorbis*, type of the genus. All the remainder are doubtfully, and in the absence of information respecting their animals, placed here. Indeed, there is good reason to surmise that they do not even belong to this family, but are rather likely to prove *Trochidæ*, and some of them, at least, are, in all probability either belonging or nearly allied to *Adeorbis*. At present, however, we prefer describing them under the genus the shell of which they most resemble. Philippi has placed some allied forms in *Delphinula* with a query. That genus is very nearly allied by both animal and shell to *Trochus*.

S. PLANORBIS, O. Fabricius.

Pale olivaceous or brown, devoid of sculpture, not lustrous, suture subcanaliculated; umbilicus not ribbed; aperture almost circular.

Plate LXXIV. fig. 1, 2, 3; and (Animal) Plate G. G. fig. 1.

Turbo planorbis, O. FABR. Fauna Groenland, p. 394, from which GMEL. Syst. Nat. p. 3602.

Helix depressa, MONT. Test. Brit. p. 439, pl. 13, f. 5.
Turbo depressus, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 170. — TURT. Conch. Diction. p. 228. — DILLW. Recent Shells, vol. ii. p. 883.—WOOD, Index Testaceol. pl. 32, f. 164.
Skenea depressa, FLEMING, Brit. Animals, p. 313. — FORBES, Malac. Monens. p. 19, animal. — JOHNSTON, Berwick. Club, vol. i. p. 273. — MACG. Moll. Aberd. p. 134. — Brit. Marine Conch. p. 158.
Delphinoidea depressa, BROWN, Illust. Conch. G. B. p. 20, pl. 8, f. 35, 36.

Of a depressed orbicular shape, the spire of this species is still a little raised, and terminates in an obtuse and rather large apex. The shell is thin (yet not so for its genus), has but little lustre, and is of a scarcely semitransparent pale olivaceous or reddish brown hue ; its surface is nearly smooth, but is marked with rather coarse wrinkles of increase. The whorls, which are four in number, and though depressed yet decidedly convex, are divided by a profoundly impressed or subcanaliculated suture ; they are of slow longitudinal increase, but the last volution enlarges most perceptibly towards the mouth, where it occupies at least one-third of the total diameter. The circumference of the final turn is not angulated but well rounded ; so likewise is the base, whose large umbilicoid cavity exposes the whole of the volutions, whose arrangement is such, that the last one does not fully clasp the preceding turn at the aperture, but is merely attached to it, and not on the same level. Hence the mouth of the shell, which occupies about two-thirds of the entire length, and nearly two-fifths of the basal diameter, projects below the general basal level ; it is almost circular, and is neither marginated nor expanded, but thin and simple. Both throat and umbilicus are alike devoid of sculpture. The outer lip slants rather more above than below, where it is peculiarly arcuated, and forms one continuous curve with the pillar-lip, which last is rather long, very thin, and curls slightly backwards. The diameter, for the most part, is not even a single line.

The animal is of a hyaline white. Its head is prolonged into a rather broad muzzle. The tentacles are rather long, cylindric, or subulate, white, with conspicuous black eyes or bulgings at their external bases. The foot is short. Beneath the transparent operculum is seen the slight process or rudimentary filament terminating the operculigerous lobe. As it walks it usually drags its shell sideways, so that often the hinder part of the foot only is applied to the ground. The tentacula, whilst the creature is moving, are often turned back or directed laterally. The operculum is thin, horny, and of very few turns.

This little Mollusk lives in great numbers under stones at low water, and among the stems and roots of *Corallina officinalis*. It is found, usually in great abundance, all round the shores of the British Islands, but from the smallness of its size often escapes notice. It ranges throughout the boreal and arctic seas.

S. NITIDISSIMA, Adams.

Extremely minute, polished, neither ribbed nor spirally striated, pellucid : suture simple ; aperture not circular.

Plate LXXIII. fig. 7, 8, 9

Helix nitidissima, ADAMS, Trans. Linn. Soc. vol. v. pl. 1, f. 22, 23, 24, from which MONT. Test. Brit. vol. ii. p. 447 ; MATON and RACK. Trans. Linn. Soc. vol. viii. p. 205 ; TURT. Conch. Diction. p. 58.

Turbo nitidissimus, FLEMING, Brit. Animals, p. 300 (from Adams).

Truncatella ? atomus, PHIL. Wiegm. Archiv. Nat. 1841, p. 54, pl. 5, f. 4 ; Moll. Sicil. vol. ii. p. 134, pl. 24, f. 5 (most probably).

Spira nitidissima, BROWN, Illust. Conch. G. B. p. 20, pl. 8, f. 42, 44 (from Adams).

This and the succeeding species are two of the most minute of our British shells, and bear a considerable resemblance to the genus *Planorbis*. For there is no projecting spire, but the shell is discoid, involute, and sunken a little in the middle, both above and below. It is very thin, highly polished, and of a clear semitransparent wax or fulvous horn-colour. Many individuals exhibit, likewise, some radiating wavy streaks of white, and a few white lines (like those of *Segmentina*) but these are possibly produced by the unequal drying of the shelly matter. To the unaided eye, or even under a lens of low power, the surface appears smooth, but under the microscope, numerous and densely disposed longitudinal wrinkles, that seem to become obsolete around the middle of the body whorl, and are more or less indistinct in the middle of the smaller turns, are clearly perceptible. There are only two and a half volutions, that are separated by a simple but strongly impressed suture, and rather gradually enlarge from a tolerably large apex. The body is rounded at the circumference, but shelves rather more above than below ; its height manifestly increases as it recedes from the lip. The aperture, which is of about equal length and breadth, and occupies more than one-third of the basal diameter, resembles in shape the moon towards its full, the projection of the penult whorl, preventing its being quite circular. The outer lip is simple, but a little thickened below, and generally appears of a rather darker tint than the rest of the shell ; it is not expanded, projects above the whorls posteriorly, and advances a little in front. A sixteenth of an inch is the usual size.

If this be the *Truncatella atomus* of Philippi, the animal is white, has lanceolate tentacula, with eyes on (not beside) their bases, and an oblong short foot, rounded at both ends—characters which assuredly remove it from the family to which *Skenea* belongs, and place it where Philippi indicates. But until the animal of our British shell be examined, we hesitate to assign it such a position.

It appears to have a wide range. Guernsey, Arran (Barlee); Donegal in Ireland (Warren); and Zetland.

S.? ROTA, Forbes and Hanley.

Extremely minute, with ribs radiating from the sutures.

Plate LXXIII. fig. 10; Plate LXXXVIII. f. 1, 2.

A miniature *Ammonite* conveys the best idea of this beautiful but most minute shell. It is discoid, flattened on both sides, but scarcely sunken in the middle, and of a somewhat pearly semi-transparent white, or very pale wax-colour. Both the upper and lower disks are adorned by numerous abruptly projecting rounded ribs, that dilate as they radiate from the well-marked sutural line, but do not quite extend to the edge of the volutions, and are separated by intervals of nearly equal size, that are either smooth or else present a single elevated radiating line; just before the termination of the ribs an obscure spiral groove occasionally runs between them, but does not traverse the ribs themselves. There are only two whorls and a half, that are convex, well-defined, and slowly enlarge from a smooth and tolerably large apex. The body is not regularly rounded, but seems, possibly from the lesser convexity of the periphery, a little subangulated both above and below. The aperture, which is raised above the level of the upper disk, is small, and nearly circular, as the penult whorl projects but slightly into it. The size is less than half a line. The animal when dried (for it was not examined in a living state) is of a wax-colour.

This rare species has been taken in Donegal by Mr. Warren and by Mr. Barlee.

S.? DIVISA, Fleming.

Pure white; lower disk spirally striated or costellated; aperture large and circular; umbilicus capacious.

Plate LXXIV. fig. 4, 5, 6.

Turbo divisus, ADAMS, Trans. Linn. Soc. vol. iii. p. 254?? from which MONT. Test. Brit. p. 334.—TURT. Conch. Diction. p. 230; *Rissoa divisa*, BROWN, Ill. Conch. G. B. p. 13.

Helix Serpuloides, MONT. Test. Brit. Suppl. p. 147, pl. 21, f. 3 (probably); from which *Turbo Serpuloides*, DILLW. Recent Shells, vol. ii. p. 884, and WOOD, Index Testac. pl. 32, f. 165, *Delphinoidea Serpuloides*, BROWN, Ill. Conch. G. B. p. 20, pl. 8, f. 40, 41.

Skenea divisa, FLEMING, Brit. Animals, p. 314.—Brit. Marine Conch. p. 159.

Valvata? striata, PHILIPPI, Moll. Sicil. vol. i. p. 147, pl. 9, f. 3; vol. ii. p. 122?

Skenea Serpuloides, Brit. Marine Conch. f. 44, worn (from type).

Adeorbis striatus, SEARLES WOOD, Crag Mollusca, p. 137, pl. 15, f. 7? (fossil).

We do not consider that the little shell we are about to describe agrees with the four-whorled oval-mouthed *T. divisus* of Adams, the paucity of whose detailed characteristics must for ever prevent the adoption of it as a species; and which was probably the mere fry of some well known species. Montagu's figure of *H. Serpuloides*, on whose base are delineated the spiral striæ denied it in the text (where it is termed smooth, but the absence of sculpture was probably enough the result of abrasion, and the description is correct in all other respects), agrees very well with our shell; but as the identity is not positive, we have preferred to adopt the name of the universally recognised and clearly defined species of Dr. Fleming.

This shell is of an uniform pure white, and of a somewhat oblique depressed-orbicular shape. It is, perhaps, less thin, glossy, and transparent than most of the species we have provisionally grouped it with. It is composed of barely three whorls, which most rapidly enlarge in size, are simply convex, and are divided by a profoundly impressed, but not canaliculated suture. The spire is scarcely elevated, the penult turn being depressed, and the apex short though rather prominent. The body is cylindrical, but rather more rounded below than above; its periphery is not at all angulated, but rather broadly rounded. Costellar striæ encircle the base, and enter the capacious mouth of the umbilical cavity; upon the middle of the whorl they are replaced by closely disposed and simply impressed striæ, and wholly or partially disappear upon the upper disk. Owing to the somewhat loose nature of

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* The *S. Serpuloides* of that writer (Brit. Anim. p. 314, copied in Brit. Marine Conch. p. 158) presents a peculiar feature which we have not seen, unaccompanied by spiral lines, in any widely-umbilicated British *Skenea*.

"Whorls three, white, smooth, glossy, subopaque, round, nearly on a level above, with a deep separating line; beneath, with a central cavity, *round which there are traces, under a high magnifier, of diverging lines of growth;* aperture circular, with the margin little reflected. Breadth about a tenth of an inch. Not uncommon from deep water."

Turton, in his "Manual of Land and Freshwater Species," has erroneously cited for his *Valvata minuta* (p. 132, f. 117) the *H. Serpuloides* of Montagu and of his own "Dictionary." In this he is not consistent, for in the first-mentioned work of his he limits the number of the whorls to two, or two and a half at the utmost, though in his earlier publication he had thus described it:—

"Shell flat, white, glossy, smooth; spires three or four, nearly flat and level on both sides, the upper surface being very slightly raised; the under side with a large and deep perforation, exposing the interior volutions; aperture orbicular, slightly adhering to but not clasping the body volution, the margin not very thin; diameter the tenth of an inch. Western coasts; and in Dublin Bay we have found them double the size." We found no specimens in Turton's cabinet which agreed correctly with this description.

the gyration, the interior volutions are exposed at the umbilicus. The mouth, which occupies nearly the entire length of the shell, and fully two-fifths of the total breadth, projects or overhangs, as it were, above, and sensibly recedes at the base; it is almost circular, the peritreme being continuous, and not tightly clasping, but merely touching, the lower end of the preceding turn. The outer lip is simple, acute, and not patulous; it projects at a right, or even an obtuse, angle from the body above, and descends below the general level of the base anteriorly. The pillar-lip is long, free, acute, and scarcely at all reflected. The diameter is about the twelfth of an inch.

The operculum is circular, flat, and multispiral.

It is greatly to be regretted that we are still unacquainted with the animal of this shell, which is rarely procured alive. It inhabits the lower part of the laminarian, and the upper part of the coralline zones, and, according to Mr. Jeffreys, ranges usually from ten to twenty-five fathoms in depth. It is rare; among its localities we may notice Exmouth (Clark); Scarborough (Bean); Weymouth, Langland and Oxwich Bays, near Swansea (Jeffreys); Isle of Man in twenty fathoms (E. F.); Loch Alsh, Oban, and Zetland (Barlee); in seven fathoms among corallines, Sanda Sound, Orkney (Thomas); Cork (Jeffreys); Birterbuy Bay and Arran Isles in Galway (Barlee).

If it prove identical with the shells above cited, described by Philippi and Searles Wood, it was present in the British seas during the Coralline crag epoch, and in the Sicilian seas in newer Pliocene times.

The genus *Separatista* of Adams has relations with this curious shell, as also has the *Planaria* of Brown.

S.? CUTLERIANA, Clark.

Orbicular, spirally striated throughout, pure white; umbilicus not ribbed.

Plate LXXXVIII. fig. 3, 4.

Skenea Cutleriana, CLARK, Annals Nat. Hist. New series, vol. iv. p. 424.

Of this rare shell we have only seen two specimens, which were kindly forwarded to us by Mr. Clark, but unfortunately reached us so late, that we have been unable to search as thoroughly as we ought into the works of foreign writers. We do not consider them identical with the *Delphinula? elegantula* of Philippi.

The shape is orbicular, with the spire decidedly raised, so as to occupy nearly one-third of the total height. The shell is very thin, semi-transparent, and of a somewhat glossy subnacreous or pinkish white; it is encircled throughout with regular and moderately close striæ, which upon the middle of the body are apparently more remote and slightly broader. There are scarcely three whorls; they rapidly enlarge both in width and height, terminate in an obtuse apex, and are divided by a fine sutural line, which, however, is very distinct, owing to the great convexity of the volutions; these are not symmetrical in their roundness, since, whilst the lower shelve is more or less abrupt, the upper portion of the turns is horizontally depressed (but not angularly shouldered). The body is ventricose, its circumference rather broadly rounded, and its base decidedly convex. The rather abrupt umbilicus is not ribbed, and does not display any of the internal coils. The large and laterally projecting mouth is almost circular, and occupies four-sevenths of the entire length of the shell. The peristome is continuous, and does not tightly clasp the preceding turn; from the somewhat slanting position of the final whorl in respect to the others, the anterior end of the aperture projects beyond the general basal level. The throat is smooth, and is not apparently nacreous. The pillar-lip is erect, narrow, elongated, and not reflected; it is much arcuated, and forms one continuous sweeping curve with the lower extremity of the acute and simple outer lip. The larger of the individuals was not a line in diameter. We doubt if these were quite mature; some lamellar wrinkles seemed to diverge in one of them from the umbilicus, and the lines of increase to become stronger and more numerous towards the mouth.

The species was discovered by Mr. Clark in the coralline zone at Exmouth, and was named by him in honour of a a lady distinguished for scientific attainments.

S.? LÆVIS, Philippi (?).

Pure white, smooth, but with the mouth of the large umbilicus spirally costellated.

Plate LXXXVIII. fig. 5, 6.

Delphinula lævis, PHILIPPI, Moll. Sicil. vol. ii. p. 146, pl. 25, f. 2?

This rare shell, of which we have only seen three examples, is intermediate in character between *Margarita pusilla* and *Skenea divisa*. It closely resembles the figure of the *D. lævis* of Philippi, but the spiral lines, in our own examples, do not extend beyond the mouth of the umbilicus; the colour is not brown, and there are not four volutions. It is of a rather depressed orbicular shape, with the anterior end of the aperture considerably below the basal level, the upper disk merely convex, the lower area much rounded, but not produced. It is rather thin, semitransparent, pure white, highly polished, and perfectly smooth, excepting at the mouth of the umbilicus, which is furnished with bluntly rounded spiral costellæ that are divided from each other by well-marked sulci. There are three subcylindraceous whorls that are much less convex above, but neither flattened nor sunken at the suture. The spire is scarcely raised; the two first volutions, of which the apical one is blunt and almost level, are short, and of slow increase; the body is ample; its suture is rendered very distinct by the somewhat abrupt rise of the succeeding whorl. The umbilical opening is large, and its cavity deep. The aperture is almost orbicular, about as high as broad, and occupies two-thirds of the entire length, and about one half the basal diameter of the shell. The peristome is continuous, but is only attached to the body by a narrow strip. Both lips are acute, and greatly arched; the outer one is not expanded, except, perhaps, at the base; the pillar-lip is elevated, a little reflected, and longitudinally wrinkled on its internal surface.

Two very minute specimens were forwarded to us along with *Marg. pusilla* by Mr. Jeffreys, and a larger one, which measured rather more than a line in breadth, and about three-sevenths of a line in length, was transmitted to us, as deserving our attention, by Mr. Alder of Newcastle-on-Tyne, after whom, in the event of their not proving to be the foreign species, we have doubtfully referred them to, we would suggest they should be named. They were dredged by Mr. Barlee, but he had not preserved their locality.

—? COSTULATA.

Plate XC. f. 1.

Margarita ? costulata, Möller, Index Moll. Grœnland. p. 8 ?

Almost at the moment of going to press, there has been transmitted to us a single dead (and consequently colourless) specimen of this strongly-featured shell. Unwilling to omit any indigenous species, and averse to constituting a genus from a single individual (and we know not into what marine genus it would naturally fall), we have provisionally appended its description to the assemblage of forms which our present ignorance of the mollusks that inhabit them have compelled us to link together as *Skeneæ.*

It agrees fairly enough with the too succinct description of Möller's *Marg. ? costulata*, but we will not venture to assert its identity, nor even that it belongs to the same genus. The brevity of definition, affected by many naturalists for whose talents we entertain the profoundest respect, although it may suffice to distinguish the species of any one particular district or country from each other, deals not sufficiently with details, to enable the describer of a different Fauna to positively identify the objects they intended to define. Negative characters must occasionally be indicated as well as the more salient positive features.

The specimen alluded to is very small, very thin and fragile, and of a globosely orbicular shape, with the spire short (though scarcely so for a *Margarita*), and the front of the aperture considerably below the basal level. Very numerous and rather wavy flattened folds, that are sometimes forked on the penult whorl, and are peculiarly well defined by their sides being abrupt instead of shelving, traverse the whorls in a longitudinal direction, and are separated from each other by narrow intervals of about similar width. There are no spiral striæ whatsoever, but a few very obscure spiral indentations are barely perceptible just within the mouth of the umbilicus. The penult whorl is moderately high, and as well as the body, which is rather ample in proportion, and rounded, yet somewhat narrowed, at the circumference, is ventricose, the turns not being flattened or sunken at the well marked suture, but abruptly swollen. The base is much rounded, and the umbilicus profound, but is neither particularly large, nor preceded by any peculiar channel-like concavity. Only two whorls and a half remain unbroken in the specimen, but judging from analogy, the volutions are few (4?) and of quick increase, the spire short, and the apex obtuse. The mouth of the example is a little worn at the edge, but is apparently simple; it is rather ample, occupying nearly one-half the basal diameter, and more than a half of the total length of the shell: it is very nearly circular, but if anything, it is rather longer than broad. The pillar-lip is rather narrow, and turns only in a slight degree towards the umbilicus. The breadth of the example is scarcely the tenth of an inch, and its length still less. It was dredged by Mr. Barlee, off Tarbert in Loch Fyne.

The figures of both the *Margarita minutissima* of Mighels (Boston Journ. Nat. Hist. vol. iv. p. 349, pl. 16, f. 5.) and of the *M. elegantissima* of Searles Wood (Crag Moll. vol. i. p. 134, pl. 15, f. 1) remind one of its aspect, yet do not coincide in many particulars. Möller observes, in reference to his own *costulata*, " Animal nondum mihi satis cognitum est ut novum genus hic constituere non audeam; *Margaritis* quidem affinis, ab illis propter peristoma continuum aperturæ et pedem animalis antice filamentis obsitum diversa est."

Since the preceding account of the *Littorinidæ* was written, we have received information respecting the animals of two species, of which the shells only are noticed in the text.

1. *Rissoa costulata.* The animal of this species has been observed by Mr. Alder. It has a very broad muzzle, and the posterior filament is the longest of any observed by that gentleman among the British species of *Rissoa.* In other respects it resembles *R. rufilabrum.*

2. *Rissoa fulgida.* This curious and beautiful little species has been taken alive at Exmouth by Mrs. Gulson, a lady to whom our science is much indebted for her zealous and successful pursuit of Malacology. Mr. Clark has forwarded to us a description of the creature drawn up from living specimens communicated by her, and has since sent to us alive and active individuals, which have travelled post to London in a small bottle of sea-water, without any apparent injury to their vitality. We can, from an examination of them, bear testimony to the accuracy of the following description :—" Mantle of the animal of the palest yellow, even with the shell ; head flat, grooved above and below ; mouth a vertical fissure ; head and neck throughout of a pale sulphur yellow hue. Tentacula short, divergent, setose, blunt, stout, hyaline white suffused with intenser minute snowy opake flakes ; eyes large and conspicuous, placed on eminences, but not on adnate offsets at the external bases. Foot mixed hyaline flake-white, not very slender, slightly auricled, with a medial

longitudinal line, rounded behind, without a caudal filament, upper lobe of foot very little, perhaps not at all, extended laterally beyond the pedal disk. Near its extremity it bears a yellow, horn-coloured, subcircular operculum, the nucleus is a slight depression, the plate is not spiral, being composed of very fine elliptic striæ of increment. The animal is not at all shy, shows its organ freely, marches with quickness and vivacity, carrying its shell sometimes at an elevation of near 80°, and often swimming with the foot uppermost."

Mr. Clark remarks that this animal can hardly be placed in the genus *Rissoa.* It seems to us to belong to the subgroup *Hydrobia*, and to be an extreme form of marine *Rissoæ,* analogous to *R. anatina*, among the brackish water species.

Under the name of Planaria, two shells, said to have been found on the coast near Dunbar, the first of which reminds us by its figure (pl. 8, f. 53, 54, 55) of *S. nitidissima*, the other (pl. 8, f. 48, 49) of *Planorbis albus*, are thus described (p. 21) in Brown's " Illustrations."

" *P. pellucida.* Shell depressed, very thin, pellucid, white, and extremely glossy, consisting of rounded volutions, slightly wrinkled across, visible on both sides of the disk ; the one next the body above nearly parallel with it, the inner ones descending into a deep umbilicus ; the centre volutions encompassed by the body ; aperture semilunar, transverse, and oblique ; outer lip thin, pillar-lip adhering to, and slightly reflected on, the columella; base rounded. Diameter a quarter of an inch ; thickness not an eighth."

" *P. alba.* Shell depressed, with four milk-white rounded volutions visible on both sides, encompassed by the body; the second ones very slightly elevated above the sides of the body, the central ones sinking into a deep umbilicus; base rounded, the volutions retiring towards the middle, and winding to a small central umbilicus; the whole crossed by very minute lines of growth or obsolete striæ ; aperture oblique, large, suborbicular, and white within ; outer lip thin and plain ; pillar-lip adhering to the columella. Diameter three-eighths of an inch, and about half that thickness."

TURRITELLIDÆ.

The British genera which we include in this family, are *Turritella* and *Cœcum*, very dissimilar in general aspect, the former being regularly spiral, the latter, in the state usually presented, uncoiled and tubular. Nevertheless, there are several points of affinity between the shells, especially the separation of the apex from the rest of the whorls as the creature advances in age, by a shelly partition; in *Turritella*, the apex is persistent, and the partition remains internal; in *Cœcum*, the apex is deciduous, and the partition terminates the adult shell. The multispiral structure of the operculum in each is an important point of resemblance and characteristic of the tribe.

The animals are, in several respects, nearly allied. Their heads are similarly formed; their eyes immersed at the outer bases of the tentacula; their sides not adorned with filaments or fringes; the operculigerous lobe simple; the foot very short in proportion to the body; the branchial plume single; the sexes probably united.

In many respects they have relations with *Vermetus* and *Siliquaria*, which seem to belong to an intermediate family conducting towards *Scalaria* and its allies.

TURRITELLA, Lamarck.

Shell spiral, turriculated, tapering, apex persistent, whorls numerous, spirally grooved. Mouth with an entire suborbicular, or slightly angulated peritreme, outer lip thin. Operculum corneous, multispiral, fimbriated at its edges.

Animal with a muzzle-shaped head, bearing two long subulate tentacles, having eyes on their external bases, slightly prominent. Foot very short in proportion to the shell, truncate in front, rounded behind, grooved beneath. Opercular lobe occupying the caudal disk, not cirrhated nor winged. Mantle with a fringed margin, obscurely siphonated at the right side. Branchial plume single, very long. Tongue very short; each series of denticles consisting of a subquadrate median, with an incurved denticulated apex, and of three similar ligulate uncini on each side, all with hamate serrulated summits.

This genus appears to be distributed, though sparingly, all over the world. More than fifty species have been described and figured. The majority are inhabitants of the Laminarian zone, from whence they are often cast on shore by the waves, but several range to great depths. Fossil species date with certainty far back into the secondary period. The genus appears to have had its maximum of development during Older Tertiary times.

The animal of *Turritella*, when full grown, does not fill up the entire length of the shell, but partitions off, as it were, part of its spire.

T. communis, Risso.

Plate LXXXIX. fig. 1, 2, 3; and (animal) Plate I. I. fig. 4.

Lister, Anim. Angl. pl. 3, f. 8.

Turbo terebra, Linn. Syst. Nat. ed. 12, p. 1239 (only a small part); Fauna Succica, p. 525.—Penn. Brit. Zool. ed. 4, vol. iv. p. 130, pl. 81, f. 113.—Mont. Test. Brit. vol. ii. p. 293.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 176.—Rack. Dorset Catalog. p. 51, pl. 15, f. 5, 6 (badly).—Turt. Conch. Diction. p. 216, f. 83.—Dillw. Recent Shells, vol. ii. p. 871.—Wood, Index Testaceolog. pl. 32, f. 137.

Strombiformis terebra, Da Costa, Brit. Conch. p. 112, pl. 7, f. 5, 6.

Turbo ungulinus (not Linn.), Müll. Zool. Danic. Prodr. p. 242.—Pulteney, Hutchins, Hist. Dorset, p. 45.

Turritella cornea, Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 255 (fide Lovén, Kiener, Reeve).—Kiener, Coquil. Vivantes, Turrit. pl. 13, f. 3.—Reeve, Conch. Icon. vol. v. Turrit. pl. 7, f. 35.

„ *communis*, Risso, H. N. Europé Mérid. vol. iv. p. 106, f. 37.—Philippi, Moll. Sicil. vol. ii. p. 160.

„ *terebra* (not Lam.), Fleming, Brit. Animals, p. 302.—Johnston, Berwick Club, vol. i. p. 267.—Macgilliv. Moll. Aberdeen. p. 141.—Brit. Marine Conch. p. 188.—Brown, Illust. Conch. G. B. p. 9, pl. 8, f. 56.—Alder, Cat. Moll. Northumb. and Durh. p. 60.—Blainv. Faune Française, Moll. p. 305.—Philippi, Moll. Sicil. vol. i. p. 190.

„ *Linnæi*, Desh. Exped. Scient. Morée, Moll. p. 146.

„ *ungulina* (not *Turbo ung.* of Linn.), Lovén, Index Moll. Scand. p. 21.

This abundant shell is usually of an elongated turreted shape, but is sometimes so abbreviated in form as only to be pyramidal turreted, at other times (yet rarely so in Britain) so produced as to be acuminated-turreted. It is usually rather thin (for the genus) than otherwise, is not very glossy, slightly diaphanous, and either stained with different intensities of uniform ferruginous brown, or else variegated with flexuous longitudinal stains of that colour on a livid ground: a snow-white variety is likewise met with in Scotland. The volutions, of which we have counted nineteen on a full-grown individual, taper to an extremely fine point, which terminates in a kind of depressed mammillation (as in the genus *Cæcum*). Each of the first ten (or characteristic) whorls is girt with three principal spiral ridges, which are narrow, rather distant, more or less acute, simple (not broken into regular tubercles), and neither traversed themselves nor interstitially by longitudinal striæ; the middle of the three ridges is the most prominent, yet is scarcely perceptibly broader than the other two. As is customary in the genus, the strength and regularity of these carinæ cease upon the larger coils, which are additionally furnished with costellar striæ. The suture is well marked, and the turns are subangulately convex ; the upper shelve is decidedly the longer and more slanting of the two. There is neither imbrication, margination, nor channel-like excavation, as in certain species of *Turritellæ.* The longitudinal increase of the whorls is gradual but sensible ; they are almost as broad above as below. The abrupt basal declination is rounded towards the mouth, and the extreme base is often tinted with vinous or dirty pink. The mouth is squarish, and the more or less arcuated outer lip is subsinuated in the middle. Our largest specimen measured nearly two inches and three quarters in length, and three quarters of an inch at the extreme breadth ; such dimensions, however, are not usual, an average-sized individual (of seventeen turns) being two inches in length, and half an inch in breadth. Examples of the white variety are, for the most part, smaller, more fragile, and with the spiral costellar lines more minute in proportion to the carinæ.

The animal of this shell has a flattened emarginated or cloven muzzle, with fimbriated edges; its tentacula are rather long, and at the external bases, on very slight bulgings, are the immersed eyes. The foot is short and strong, grooved below, angulated in front, and rounded behind, where it bears on a simple caudal lobe the round multispiral fringed operculum. The general hue of the head, foot, and sides, is white, sometimes tinged with tawny, and always more or less dotted and speckled with fulvous and black. The tentacula are often tawny at their bases, and yellowish above the eyes. The margin of the mantle is fringed with minute tripinnated lobes, which are reflected on the margin of the shell. The stomach in this creature is very long.

This is one of the commonest British shells, being distributed all round our coasts, and frequently, especially in muddy and weedy localities, in great abundance. It has a wide range in depth, extending from four to one hundred fathoms. Its chief habitat is in the shallower seabeds, occurring in immense numbers in many places in from seven to ten fathoms, but we have notes of its capture alive on various parts of our coast, both north and south, and often very far from land, in fifty, sixty, eighty, ninety and one hundred fathoms,—the latter instance having been off the Zetland Isles, where Mr. M'Andrew took a beautiful colourless variety from that great depth. It ranges throughout the European seas, but is most characteristic of the Celtic and Boreal provinces. As a fossil it is believed to have originated during the Miocene epoch, and was certainly present in our area in the older Pliocene sea.

SPURIOUS.

T. DUPLICATA, Linnæus.

LISTER, Anim. Angl. pl. 3, f. 7; Hist. Conch. pl. 591.—BONANNI, Mus. Kirch. pl. 114.—SEBA, Thesaur. vol. iii. pl. 56, f. 7.

Turbo duplicatus, LINN. Syst. Nat. ed. 12, p. 1239.—DONOV. Brit. Shells, vol. iv. pl. 112.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 175.—TURT. Conch. Diction. p. 216.—MARTINI, Conch. Cab. vol. iv. pl. 151, f. 414.—BORN, Testacea Mus. Cæs. Vind. p. 357.—DILLW. Recent Shells, vol. ii. p. 869.—WOOD, Index Testaceolog. pl. 32, f. 132.

Strombiformis bicarinatus, DA COSTA, Brit. Conch. p. 110, pl. 6, f. 3.

Turritella duplicata, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 251.—FLEMING, Brit. Animals, p. 303.—SOWERBY, Genera Shells, Turritella, f. 1.—KIENER, Coquilles Vivantes, Turr. pl. 1.—REEVE, Conch. Iconica, vol. v. Turrit. pl. 1, f. 2.

Encyclop. Méthod. Vers, pl. 449, div. 2, f. 1.

From the Indian Ocean; introduced by Lister as procured from the Scarborough fishermen.

T. IMBRICATA, Linnæus.

SEBA, Thesaur. vol. iii. pl. 56, f. 13.
Turbo imbricatus, LINN. Syst. Nat. ed. 12, p. 1239.—SCHRÖTER, Einleit. Conch. vol. i. pl. 3, f. 21.—DILLW. Recent Shells, vol. ii. p. 868.
„ *variegatus*, LINN. Syst. Nat. ed. 12, p. 1240.—DILLW. Recent Shells, vol. ii. p. 872.
„ *terebra*, DONOV. (not Linn.) Brit. Shells, vol. i. pl. 22, f. 2.
Turritella imbricata, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 253.—KIENER, Coquilles Vivantes, Turrit. pl. 9, f. 2.
„ *variegata*, REEVE, Conch. Iconic. vol. v. Turrit. pl. 5, f. 19.

A West Indian shell figured by Donovan for T. communis.

T. CINCTA, Da Costa?

LISTER, Hist. Conch. pl. 592, f. 60.
Strombiformis cinctus, DA COSTA, Brit. Conch. pl. 7, f. 8?
Turbo cinctus, DONOVAN, Brit. Shells, vol. i. pl. 22, f. 1.—MONT. Test. Brit. p. 295.
„ *exoletus*, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 176.—TURT. Conch. Diction. p. 216.—DILLW. Recent Shells, vol. ii. p. 870. —WOOD, Index. Testac. pl. 32, f. 136.
Turritella bicingulata, LAM. (not Crouch) Anim. s. Vert. (ed. Desh.) vol. ix. p. 256.—Brit. Marine Conch. p. 189.—KIENER, Coquilles Vivant. Turrit. pl. 8, f. 2.—REEVE, Conch. Iconica, vol. v. Turrit. pl. 5, f. 20.
„ *exoleta*, FLEMING (not Lam.), Brit. Anim. p. 302.

From Africa, &c.; said to have been taken at Sandwich, Lincolnshire, and Lancashire.

CŒCUM, FLEMING.

Shell, when young, discoid; when adult, tubular, cylindrical, arcuated, terminating anteriorly in a round mouth with entire margin, posteriorly by an obtuse rounded or mammillated septum, marking the point at which the original spire has been cast off. Operculum corneous, multispiral, edges simple.

Animal when adult cylindrical: head muzzle-shaped, flanked by cylindrical subulate tentacula bearing minute eyes on (not on bulgings of) their external bases. No lateral cirrhi nor lobes. Foot short, narrow, truncate in front, obtuse behind. No posterior cirrhus. Mantle thick, not fringed. A single branchial plume. Tongue short; central denticles apparently undeveloped; two uncini on each side, the inner one broad and serrulated.

There are few among our British testacea more curious or more puzzling than the singular little shells we have now to describe. Their external aspect seemed so analogous to the tooth-shells from which they appeared to differ chiefly in their hinder ends being closed instead of open, that the older conchologists considered them as members of the genus *Dentalium*. Dr. Fleming first separated them generically, but with uncertainty respecting their true value or position, since afterwards in his "British Animals" he referred them, unfortunately, to *Orthocera*. Captain Brown constituted his genus *Brochus* for them, and Philippi his *Odontidium*, but Fleming's name of *Cœcum* has undoubted priority. Mr. Berkeley speculated on their being annelides allied to *Ditrupa*, the shell of which, until he discovered its true construction, had been also confounded with *Dentalium*. Philippi suggested that they might be *Pteropoda*, a conjecture which need not have been hazarded had our valued correspondent, Mr. Clark, been less indifferent to fame, and made known his numerous original researches in good time, since as long ago as 1834 he had examined and fully ascertained the animal of *Cœcum trachea*, proving it to be a true mollusk, far removed, however, from *Dentalium*, though not until 1849 were his researches communicated to the public.* From his excellent memoir our account of this curious creature is chiefly derived.

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* Annals of Natural History, 2nd Ser. vol. iv. p. 180.

The genus appears to have begun, so far as we yet know, during the Eocene period, since, according to Mr. Searles Wood, a species of it has been found at Hordwell by Mr. Edwards. In later tertiaries several species occur.

C. TRACHEA, Montagu.

Tolerably strong, with numerous close-set annular sulci.

Plate LXIX. fig. 4, and (Animal) Plate K K, fig. 1.

Dentalium imperforatum, ADAMS, Microscope, pl. 14, f. 8. — MONT. Test. Brit. vol. ii. p. 496. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 238.—TURT. Conch. Diction. p. 39. —Brit. Marine Conch. p. 4.—DILLW. Recent Shells, vol. ii. p. 1067. — WOOD, Index Test. pl. 38, Dent. f. 12.

„ *trachea*, MONT. Test. Brit. vol. ii. p. 497, pl. 14, f. 10. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 239. — Brit. Marine Conch. p. 5, fig. 61. — DILLW. Recent Shells, vol. ii. p. 1068.—WOOD, Index Test. pl. 38, Dent. f. 13.

Orthocera imperforata, FLEMING, Brit. Animals, p. 237.

Odontidium rugulosum, PHILIPPI, Moll. Sicil. vol. i. p. 102, pl. 6, f. 20, and vol. ii. p. 73.

Brochus trachiformis, BROWN, Illust. Conch. G. B. p. 124 (pl. 56, f. 10, bad).

„ *striatus*, BROWN, Illust. Conch. G. B. p. 124, pl. 56, f. 13.

Although larger than the next species, this too is a very small shell, scarcely exceeding the eighth of an inch in length, which for the most part is to the breadth as five to one. It is subcylindrical, moderately curved, tolerably strong, not transparent, and of a whitish hue, that in the more recent specimens is generally stained with ferruginous or rust colour, in lighter and darker circles. It tapers slightly towards the imperforated end, where the sculpture abruptly terminates in a short projection, which is either simply obtuse, or a little recurved and bluntly attenuated. The surface is densely annulated with coarse and regular sulci, that vary as to approximation in different specimens, but for the most part become more crowded towards the aperture. Both these and the intervening ridge-like spaces, which latter often present a somewhat imbricating appearance, for the most part, exhibit under the microscope extremely close and equal-sized longitudinal striulæ, that appear in some to be almost imperceptible, in others to be strongly impressed. The dorsal or arcuated side of the shell is clearly, though not greatly, the longer. The mouth is suborbicular, and a little contracted.

Brown's figure of *striatus* is an excellent representation of the adult form of this species, and corrects his statement that it is destitute of a posterior knob.

"I have as yet," observes Mr. Clark, "met with only two phases of this shell, the taper produced arcuated form, and the shorter less curved final condition."

Animal pure white, mantle very thick and fleshy, fitting the shell closely, and not extending beyond its anterior margin; body elongated and slender, head long and flat, cloven at the extremity and closely ridged subtransversely, on all occasions in advance of the foot: fissure of the mouth vertical; tentacula short, rather thick, subcylindrical, setose, and slightly clavate at the extremities; eyes very minute, black, not raised on any eminence, placed nearly in a line with the tentacula, at a short distance from their bases. The neck is furnished with longitudinal ridges, and on each side of its centre there are two frosted, yellowish white, contiguous round lines forming a very decided canal or groove, the points of which terminate anteriorly at the immediate base of the eyes, and posteriorly at the furthest end of the neck, on the left side of which at the dorsal point, may be seen a minute pale red branchial leaflet. The neck did not exhibit the slightest traces of external reproductive organs. Foot short, narrow, and truncate anteriorly. Operculum circular, corneous, black-brown, smooth and conical on the surface, attached to the foot, concave without, and from its centre seven or eight fine close-set spiral lines fill up the area. The animal is not at all shy, it shows itself in all directions, marches with great vivacity, carrying its shell sometimes with the convexity upwards, resting on the posterior point or on one of the sides, frequently changing one for the other, by suddenly withdrawing the head and body by which action it is thrown on the operculum at an elevation of fifty or sixty degrees; it then turns on the side it wishes. (Clark.) Specimens forwarded alive by their discoverer to London lived for several days in a vial of sea-water, and exhibited all their features; from them we have taken our figures.

Widely distributed, yet rare. Exmouth, in the coralline zone (Clark); Torbay (S. H.); Falmouth, Whitesand Bay, Weymouth, Swansea Bay, Tenby, Loch Carron, in Scotland, Bantry Bay, and Cork Harbour (Jeffreys). It ranges to the Mediterranean.

We have not cited the *Orthocera trachea* of Fleming, (Brit. Anim. p. 237) which is described as a white shell, having the rings regular and sharp in the young,* but

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* This agrees with two individuals thus named in Mr. Alder's collection which, with his usual candour, he acknowledges to have received from a doubtful quarter. They are transparent and snowy white, with moderately distant, keel-like rings, some of which are sharp at the edge and others rounded. They do not appear to be traversed by any regular longitudinal striulæ either on the annuli or their intervals. We have received this species, likewise, from Aden in Arabia.

"rounded in a larger one, in which those near the mouth are largest, and the whole are crossed by obsolete longitudinal ridges."

This last appears to agree with the *Brochus annulatus* and *reticulatus*, Brown, Illust. Conch. G. B. pp. 124, 125, pl. 56, f. 12 (adult) 11 (young).

The genus Cœcum has not been studied with that due attention to its foreign members which alone entitles us to pronounce upon what are the permanent characters by which its species are determinable. Hence we feel some hesitation in regarding the present shell as distinct from *trachea*, especially as we have seen but a single specimen. (Pl. LXXXVIII. fig. 7.)

The individual alluded to was forwarded to us by Mr. Alder as from the south coast of England, and bears a marked general resemblance to the preceding shell. It is evidently a dead example, hence its opacity and squalid white hue are of no value as distinctions. The great peculiarity consists in the annular ridges, being regularly and distinctly, though very finely, costellated in a longitudinal direction, the raised lines being partially, also, continued in the interstitial furrows where the microscopic striulæ that are so generally present in *trachea* are likewise here and there perceptible. The first three annulations are strong and projecting, but after them the ridges are so depressed that their edges alone are elevated, so that they resemble lamellæ. The clausum or posterior termination is almost entirely concealed within the tube, and is very acute and narrow, with its point adjacent to the arched side of the shell.

C. GLABRUM, Montagu.

Very thin, pure white, smooth or nearly so.

Plate LXIX., fig. 5.

Dentalium minutum, Linn., ed. 12, p. 1264 (probably).—Dillw. Recent Shells, vol. ii. p. 1068.

Dentalium glabrum, Mont. Test. Brit. vol. ii. p. 497.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 239.—Turt. Conch. Diction. p. 40. —Brit. Marine Conch. p. 4, fig. 5.
Cæcum glabrum, Fleming, Edinb. Encyclop. pl. 204, f. 7, and pl. 205, f. 8, 9.
Orthocera glabra, Fleming, Brit. Animals, p. 237.
Odontidium lævissimum, Cantraine, Bull. Brux. vol. ix. pt. 2 (1842), p. 340. ?
Brochus glabrus, Brown, Illust. Conch. G. B. p. 125, pl. 56, f. 3.
,, *lævis*, Brown, Illust. Conch. G. B. p. 125, pl. 56, f. 6 (probably).

This minute shell, which only measures a line in length, is very thin, semitransparent, glossy, snow white, and almost smooth. When aged it is nearly straight, but when simply adult, it is moderately arcuated, cylindraceous, and of nearly equal diameter throughout, merely tapering slightly at its imperforated or posterior termination, which is furnished with a moderately projecting rounded knob. The length in general is about five times the breadth. The aperture is neither contracted nor dilated, but simple and suborbicular. The dorsal or arcuated side of the shell is clearly the longer.

According to Mr. Clark, the fry is coiled into a spiral at the narrower extremity, in which state it is figured by Walker in his "Testacea minuta" (f. 11, from which *Serpula incurvata*, Adams, Micros. pl. 14, f. 7; Maton and Rack. Trans. Linn. Soc. vol. viii. p. 246; Turt. Conch. Dict. p. 156; Dillw. Recent Shells, vol ii. p. 1071; *Vermiculum incurvatum*, Mont. Test. Brit. p. 518; *Cornuoides major*, Brown, Illust. Conch. G. B. p. 125, pl. 56, f. 49).

The figure of the *Brochus arcuatus* of Brown (Ill. Conch. G. B., p. 125, pl. 56, f. 9) reminds one of a curved and elongated form of this species. It is stated to have measured the eighth of an inch, and to have been taken from the sand of Bantry Bay. What, however, we had regarded as the representative of that shell, is considered by Mr. Clark (whose studious examination of a multitude of individuals of this genus gives much weight to his opinion) as a worn individual of *trachea* in its produced and arcuated immature condition.

This species in most respects resembles the *C. trachea.* The tentacula, as in the latter, are frosted white and setose, but they appear to be proportionably longer, slenderer and more elevate at the tips; these variations, however, are scarcely appreciable. The foot is very short, truncate in front, rounded behind, and carried much more laterally in this species than in *trachea;* and on its posterior upper part is the most differential point in the animals, the curious operculum, which is circular, and has six or seven spiral gyrations of a pale yellow, but instead of being concave or flat without and conical within, as in *trachea*, it is in both respects the reverse. It is more active in its movements. (Clark.) Through the kindness of Mr. Clark we have examined the living animal, and can bear testimony to the accuracy of his notes.

The *Cœcum glabrum* is rare, yet widely distributed. Exmouth, off Budleigh Salterton, six miles from shore, in ten fathoms water (Clark); Burrow Island and Guernsey (S. H.); Falmouth, Sandwich, Weymouth, Swansea, and adjacent bays, Tenby (Jeffreys). Lerwick in Zetland (Jeffreys). Cork Harbour and Bantry Bay (Jeffreys).

CERITHIADÆ.

In this family we include *Cerithium* and *Aporrhais*, genera remarkable among canaliculated shells for the muzzle-shaped heads and corresponding features of organization of the animals which construct them. They seem to constitute a group in many respects intermediate between the holostomatous and siphonostomatous *Pectinibranchiata*, partaking of and mingling many of the characters of both. They are closely allied on the one hand to the *Turritellidæ* with which family *Cerithium* has intimate relations, and on the other to the *Scalariadæ*, the latter relationship being better seen and traced through *Aporrhais* in fossil than in living examples of the tribe, some fossils of the last-named genus approaching very closely to *Scalaria*. The *Cerithiadæ* serve to warn us how we trust to the shell alone as a clue to natural relations, for in them we have an assemblage of creatures which the collector apparently not unreasonably would rather place beside the *Muricidæ* than where they really should be, since in them the form of the shell (pneuma-skeleton) is of but slight importance compared with the modifications of the organs of their respiratory and nutritive systems. The canal of the orifice of the shell, indeed, depends on the presence of a rudimentary siphonal fold, such as we see in the *Littorinidæ*, and not of a prolonged siphonal process, such as the *Muricidæ* possess.

APORRHAIS, Da Costa.

Shell turreted, strong, variously ornamented with ribs, nodules, or striæ, many-whorled. Aperture when adult angulated, canaliculated, with the outer margin expanded and lobed or digitated; when young, simple, and sinuously angulated with a moderate canal. Operculum corneous, lenticular, concentric.

Animal with a long muzzle; tentacles cylindric, bearing eyes on prominences near their external bases; mantle digitated, loose, with a rudimentary siphon; foot rather short, angular in front, obtuse behind, not centrally grooved; operculigerous lobe simple; branchial plume, single, long; male organ under the right tentacle, flattened, curved, slender; tongue linear "with a single median denticle, and three uncini on each side, the second and third elongated and simple." *

The name now adopted by general consent for the genus, of which our common Pelican's foot shell is the type, was first used and applied to it by Aldrovandus. Da Costa adopted it as a generic appellation, strictly so called, but extended it apparently to *Strombus* and *Pterocera*. Philippi was the first rightly to define the genus as now understood, and himself to understand its characters; he proposed to call it *Chenopus*. The general adoption in the majority of conchological works of the former name induces us to prefer it, deeming that a sufficient reason for the preference in this instance. The animal of *Aporrhais* was made known by O. F. Müller, and afterwards by Delle Chiaje. It differs essentially from *Rostellaria*, *Strom-*

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* Lovén.

bus, and *Pteroceras*, which belong to a distinct family. The affinities of *Aporrhais* with *Cerithium* have been observed by Swainson and others, and are very evident when we look at the young shells of the former, or compare the animals of both. There are not a few fossil species of this genus, ranging far back in time.

A. pes-carbonis, Brongniart.

Spire shorter than body; digitations usually five, narrow and produced; the caudal one very long and narrow, its point either straight or inclined upwards.

Plate LXXXIX. fig. 5, 6.

pes carbonis, Brong. Terr. du Vicent. p. 75, pl. 4, f. 2.
Rostellaria Serresiana, Michaud, Bull. Linn. Soc. Bordeaux, vol. ii. pl. 1, f. 3, 4 (fossil); copied, Férus. Bull. Scienc. Natur. vol. xvii. p. 308. — Potiez and Mich. Galerie Douai, Moll. vol. i. p. 449.
„ *pes-pelecani*, *var.* Kiener, Coq. Vivant. Rost. pl. 4, f. 1, c.
Aporrhais pes-carbonis, Sowerby, Thesaur. Conch. vol. i. p. 21, pl. 5, f. 1.
Chenopus „ Desh. Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 657.
„ *Serresianus*, Philippi, Moll. Sicil. vol. ii. p. 185, pl. 27, f. 6.

We owe to the researches of that enterprizing naturalist R. M'Andrew of Liverpool, among the less accessible portions of the British Islands, the addition of one of the very few recent species of this genus, to the Fauna of Great Britain.

Exclusive of the extremely dilated outer lip the shape is fusiform, and greatly attenuated at both extremities. The shell, although moderately strong, is less so than are the other two known recent species of *Aporrhais*, is more or less opaque, not much polished, and of an uniform paler or darker tawny hue; the ivory-like enamel which lines the outer lip, and is spread over a considerable portion of the ventral surface is decidedly lustrous, and the throat has frequently a livid tinge. In addition to the fine spiral slightly raised lines which closely traverse the entire exterior, the whorls of the spire are adorned with longitudinal prominences, which on the earlier rounded coils take the shape of close-set obliquely arcuated narrow folds, and gradually as the turns become angulated in the middle become converted into a spiral row of rather small and moderately distant laterally compressed subcentral nodules. Besides this series, which is continued upon the body-whorl, two more rows encircle the latter in the shape of more or less nodulous carinæ, which being divergently produced to the extremity of the outer lip, form the angulated medial crests of the labial digitations. The third of these keels, which also is the less strong and less nodulous, is approximate to the other; the second is rather more remote from the first, than that is from the suture, and lies nearly half way between the latter and the extreme end of the tail. The spire, which is composed of eight or nine turns, which are divided from each other by a fine sutural line, and are of moderate longitudinal increase, is rather shorter than the body, and apparently ends in a rather obtuse point (but we have never met with a specimen where it was quite perfect). Of the acutely lanceolate processes or digitations into which the greatly expanded outer lip is divided, all of which are simple (not geniculated) and gradually are acuminated to very fine points, the first, whose base is attached to the three lower turns of the spire, runs up (in the adult) almost perpendicularly to nearly the height of the apex, and at times beyond it; the second, whose lateral projection is by far the greatest, bends a little upwards; the third and fourth (which latter is often rudimentary or almost entirely wanting) lean slightly downwards; the fifth or caudal process is very narrow, greatly produced, and terminates in a particularly acute point that slopes dorsally (or upwards); it runs perpendicularly downwards, and indeed is a mere prolongation of the anterior extremity of the body. Upon the thickened inner side of the lip (which is otherwise perfectly smooth) profound grooves mark the diverging course of the external keels; the throat and pillar are devoid of any sculpture, save a laterally compressed longitudinal pad upon the latter opposite to the two inferior belts of nodules. There is a slight but rather diffused inflection of the margin of the outer lip at the commencement of the caudal process.

Our native examples, which were thin, yet apparently fully formed, at most measured an inch and a quarter in length, and a fifth less for the extreme breadth between the point of the second digitation, and the edge of the whorl immediately opposite to it. A foreign individual vied with *pes-pelecani* in length and surpassed it in breadth.

This fine species was dredged in seventy, ninety, and one hundred fathoms off the east coast of Zetland (M'Andrew). It has since been taken in the same district by Mr. Barlee.

A. PES-PELECANI, Linnæus.

Spire, if anything, longer than the body: digitations usually four, short and broad; the caudal one stunted, and a little dilated, its point leaning ventrally or downwards.

Plate LXXXIX. fig. 4, and (Animal) Plate II. fig. 3.

LIST. Hist. Conch. pl. 865, f. 20. — GINANNI, Oper. Postum. vol. ii. pl. 7, f. 58, 59, 60. — KNORR. Délices des Yeux, pt. 3, pl. 7, f. 4.

Strombus pes-pelecani, LINN. Syst. Nat. ed. 12, p. 1207. — PENN. Brit. Zool. ed. 4, vol. iv. p. 122, pl. 75, f. 94. — PULT. Hutchins, Hist. Dorset, p. 42.—DONOV. Brit. Shells, vol. i. pl. 4.—

—Mont. Test. Brit. vol. i. p. 253.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 141.—Rack. Dorset Catal. p. 46, pl. 15, f. 7.—Turt. Conch. Diction. p. 165, f. 50, 51.—Born, Test. Mus. Cæs. p. 270, and vign. at p. 269.—Olivi, Zool. Adriat. p. 148.—Dillw. Recent Shells, vol. i. p. 656.—Wood, Index Testac. pl. 24, f. 4. —Costa, Test. Sicil. p. 82 (animal).

Pes-pelecani, Martini, Conch. Cab. vol. iii. p. 142, pl. 75, f. 848, 849.

Aporrhais quadrifidus, Da Costa, Brit. Conch. p. 136, pl. 7, f. 7.

Tritonium pes-pelecani, Müller, Zool. Danic. pl. 87, f. 1, 2.

Rostellaria „ Lamarck, Anim. s. Vert. (ed. Desh.) vol. ix. p. 656. — Fleming, Brit. Anim. p. 359.—Macgill. Moll. Aberd. p. 173.—Brit. Marine Conch. p. 211.—Brown, Illust. Conch. G. B. p. 5, pl. 5, f. 21, 39. — Crouch, Introd. Lam. Conch. pl. 18, f. 3.—Sowerby, Genera Sh. Rost. f. 3.—Blainv. Faune Franç. Moll. p. 202, pl. 8, f. 1.— Desh. Encycl. Méth. vol. iii. p. 909. —Joannis, Mag. de Zool. ser. 1, Moll. pl. 41, animal. — Sowerby, Manual Conch. f. 404.—Kiener, Coq. Viv. Rost. pl. 4, f. 1, 1 a. — Reeve, Conch. System. pl. 246, f. 5. — Cuvier, Règne Anim. (ed. Croch.) pl. 61, bis, f. 3.

Chenopus „ Philippi, Moll. Sicil. vol. i. p. 215; vol. ii. p. 185.— Johnston, Berwick. Club, vol. i. p. 232.

Aporrhais „ Swainson, Malacology, p. 309, f. 76, a; and p. 142, f. 15, a (young). — Sowerby, Thesaur. Conch. vol. i. p. 21, pl. 5, f. 3, 4.

Delle Chiaje, Poli, Test. Sicil. vol. iii. pt. 2, pl. 48, f. 7 to 10 (animal).

There is so much general similarity between this and the preceding species, that, to economize space, we shall merely indicate the more striking points of difference, and add only a few further remarks on the species.

It is a much more solid shell, and in our native examples a much larger one, measuring commonly two inches in length, and an inch and a third in breadth. The digitations are short and broad (the fourth seems, at most, rudimentary) and are occasionally disposed to become palmated; the apex of the upper one does not nearly approach the level of that of the spire, and its base more frequently covers two than three of the volutions of the latter. The broad and stunted tail leans ventrally or downwards. The inner side of the right lip displays more or less evident traces of incipient raised crenæ at the commencement of the throat. The nodules are larger in proportion than in the last species, and consequently the interval on the body between the rows of them is less wide; moreover, they are disposed to become confluent.

In both species of *Aporrhais*, the suture is surmounted by an obscure row of very short and scarcely raised small nodulous folds; these are rather more prominent in the present shell, whose colouring has usually a stronger tinge of rufous or chestnut, a central band of which colour often runs between the nodules of the spiral belt.

The digitations are only completely formed in the mature examples; hence, as Swainson justly observes, the young bear a marked resemblance to *Cerithia*.

The animal has been often figured and described. One of the fullest descriptions is that given by Dr. Johnston. We offer a fresh figure from a beautiful drawing by Mr. Alder. It is of a general yellowish-white hue, the tentacula mingled yellow and scarlet; the snout and head thickly speckled with scarlet, markings of which colour are more sparingly distributed on the paler body and sides of the foot; sometimes they are not present. The muzzle is long and cylindrical, emarginated at its extremity; the head is rather broad, and bears on each side a long cylindrical tentacle, swollen at its base, where the eye is placed on a prominent bulging. The mantle is loose, ample, and digitated; it forms a rudimentary siphon in the region of the canal of the shell, but is not extended beyond it; the foot is oblong, obtusely angulated in front, and scarcely pointed behind; on its caudal surface it bears a small elliptical horny operculum of three or four concentric layers. Dr. Johnston remarks that the creature "creeps very slowly, the tentacula being widely extended, and used as feelers." We have always found it very sluggish and unwilling to display itself when captured.

This curious mollusk is generally distributed around the British shores, so much so, that to enumerate localities would be superfluous. It ranges from a depth of four to as much as one hundred fathoms, and has been dredged alive in many intermediate depths. It affects gravelly bottoms.

It inhabits all the coasts of Europe, and is found fossil in both red and coralline crags, and in pleistocene strata.

CERITHIUM, Adanson.

Shell spiral, turriculated, with an elongated many-whorled spire, usually solid, surface variously ornamented with ribs, grooves, and tubercles, rarely smooth; aperture subquadrate, terminating below in a more or less developed, short, usually recurved canal. Operculum corneous, spiral.

Animal with a thick muzzle-shaped head bearing two subulate tentacles with eyes on prominent bulgings near their external bases; no neck-lobes or lateral filaments; mantle with a short siphonal fold; foot sub-triangular, rather short.

This is a large genus, including between one and two hundred species, some of which have been set apart under other generic appellations, on account of slight modifications of the canal of the shell, and a supposed correspondence between these peculiarities and the habits of the animal. All our British examples are truly marine, and are small and inconspicuous. In tropical seas, and in the ancient sea-beds of the earlier tertiary epochs, there are *Cerithia* of great size. The absence of a retractile proboscis, the muzzle-shaped head, the spiral operculum, and elongated shell, with a canaliculated recurved aperture, are the characters which combined mark the entire assemblage of species. The so-called *Cerithium tuberculare*, a British shell which has all the aspect of *Cerithium*, but which differs most essentially, since its operculum is not spiral and it has a retractile proboscis, must be excluded from the usual list of species, and will be found described in its proper place hereafter.

C. RETICULATUM, Da Costa.

Brown, with four spiral rows of granules on the lower whorls of the spire.

Plate XCI. fig. 1, 2, and (Animal) Plate II. fig. .

? *Turbo punctatus*, LINN. Syst. Nat. ed. 12, p. 1231.

Murex scaber, OLIVI, Zool. Adriat. p. 153 (merely from GUALT. pl. 58, f. 1).— COSTA, Testac. Sicil. p. 89.

Strombiformis reticulatus, DA COSTA (1778), Brit. Conch. p. 117, pl. 8, f. 13.

Murex reticulatus, PULTENEY, Hutchins, Hist. Dorset, p. 43. — MONT. Test. Brit. vol. i. p. 272. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 150.—RACK. Dorset Catalog. p. 47, pl. 14, f. 13. — TURT. Conch. Diction. p. 96. — DILLW. Recent Shells, vol. ii. p. 758. — WOOD, Index Testac. pl. 28, f. 165.

Cerithium lima, BRUG. Encycl. Méth. Vers, vol. i. p. 495. — LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 304. — PHILIPPI, Moll. Sicil. vol. i. p. 195 ; vol. ii. p. 162.

" *Latreillii*, PAYRAUDEAU, Moll. Corse, p. 143, pl. 7, f. 9, 10.

" *scabrum*, BLAINVILLE, Faune Française, Moll. p. 155, pl. 6, A. f. 8.— DESH. Exped. Morée, Moll. p. 181. — KIENER, Coquilles Vivant. Cerith. p. 73 (not vars.), pl. 24, f. 2.

Terebra reticulata, FLEMING, Brit. Animals, p. 346.

Cerithium reticulatum, HANLEY, Conch. Book of Spec. p. 77. — Brit. Marine Conch. p. 193. — LOVÈN, Ind. Moll. Grœnl. p. 23, animal.

The specific name *scabrum*, was undoubtedly prior to that of *reticulatum*, but as Olivi has so wretchedly defined his shell, that it is only the assigned locality which enables us to recognize what he meant, we have preferred the epithet which was first attached to the species described and delineated in such a manner as to secure its recognition.

Of this shell we have two principal varieties in England, the one subulate and strengthened with longitudinal varices, the other without them, and of a more abbreviated shape. The former has sometimes fourteen whorls, the latter more often only ten. In native examples, the varicose individuals are usually of an uniform chocolate or dark brown colour (pale tawny when dead) ; the other variety more frequently is yellowish-brown, with its raised spiral lines (the nodules excepted) of a rich dark brown hue ; this colouring, however, is frequent in Mediterranean specimens of the former variety.

The shell is thin, not very strong, tapers from the base to the summit, and is adorned with four spiral rows of granular nodules on each of the principal or lower turns of its spire, which asperities are produced by the intersection of numerous almost perpendicular narrow rib-like folds, which run lengthwise from the summit to the base of each of these volutions, and revolving and equidistant costellar lines. Of these last, there are about five additional almost simple ones on the base of the body, where the folds are no longer present. Sometimes the folds, sometimes the costellæ, are the more prominent, but the latter are always more closely disposed than the former, which, indeed, on the earlier turns, where there are but three or even two revolving lines, are few and distant. The varices, when present, are at times rare and scattered, at times form an almost continuous series opposite the lip. The whorls are of slow increase, rather short than otherwise, and are simply and but moderately convex, not being partially swollen or excavated as in certain of the genus. The suture, though not very broad, is well marked : the apex is very acute. The mouth, which does not occupy a fourth of the entire length, is small, but little expanded, of an oval shape, scarcely angulated above, and rounded below, where it terminates in a slight canal, that is neither produced nor reflected, but leans away from the outer lip. This last is convex, simple, acute, and entire ; not being either lobed or sinuated. The throat is plain, and of the external colouring. The pillar-lip has neither pad nor fold, is shining, moderately incurved, and usually tinged with livid purple. Five lines and a half in length, and nearly one and a half in breadth, were the dimensions of a fair-sized example.

The animal, of which, besides our own notes, we have been favoured with a drawing by Mr. Alder, and fresh observations by Mr. Clark, is rather short as compared with the shell ; it is of a yellowish-white hue, with dusky markings. Its muzzle is long, rather broad, and vertically cloven at the end, as well as the head and neck dusky and marked with black and brown transverse lines. The tentacles are cylindrical, not remarkably long, or pointed, always exceeding in length the snout, though not greatly, yellowish, speckled with dusky and opaque yellow, in some instances marked with two fine dark-brown lateral lines; the eyes are borne on rather prominent pale bulgings at their external bases. The foot is obtusely triangular, and is gently auricled in front. According to Lovèn, the operculigerous lobe has rudimentary expansions on each side, and is furnished with a roundish lanceolate cirrhus. We have not seen this in the adult. Mr. Clark has, however, noted a fine almost transparent triangular membrane laid on the pedal disk, which accords with Lovèn's account. The sides of the foot are speckled, striped or clouded with dusky brown. The striæ of the brown horny operculum are spirally subcircular with four volutions.

This species is found very abundantly in many localities, chiefly on the west and south. It ranges all along the British Channel on both sides, around the Irish coast, and the western coast of England and Scotland, abounding in many places in the Hebrides. Rare in the central part of the Irish Sea (E. F.) It occurs at low-water-mark; very abundant, living among *Zostera* in the Laminarian zone, and we have dredged dead specimens as deep as twenty fathoms on the coast of Cornwall. The recorded east coast localities seem to be due to its transportation in ballast. It ranges all along the shores of Europe, from Norway to the Mediterranean, though apparently of comparatively recent origin within our area.

C. ADVERSUM, Montagu.

Sinistral: whorls with two or three rows of granules on each.

Plate XCI. fig. 5, 6.

Murex adversus, MONT. Test. Brit. p. 271; Suppl. p. 115.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 151. — TURT. Conch. Diction. p. 97. — DILLW. Recent Shells, vol. ii. p. 758. — WOOD, Index Testac. pl. 28, f. 167.

Turbo reticulatus, DONOV. Brit. Shells, vol. v. pl. 159.

Terebra perversa, FLEMING, Brit. Anim. p. 347.

Triphoris adversus, THOMPSON, Report Brit. Assoc. 1843, p. 257 (no description).

Cerithium adversum, Brit. Marine Conch. p. 194. — SEARLES WOOD, Crag Mollusc. p. 72, pl. 8, f. 8 (fossil).

This interesting sinistral species appears to have been confounded by foreigners with the *perversum* of the Mediterranean, than which it is a far scarcer and less diffused mollusk. The shell is moderately strong, glossy, of an uniform rufous colour when dead, but in living examples rich brown, with the raised sculpture paler, or of a yellowish cast. As the last turn is a little contracted, and the penult rather broad, the shape is almost cylindrical below; above, the spire tapers rather quickly to a very pointed apex (the upper coils, however, are generally lost in such specimens as are usually found upon the shore). The whorls are almost flat, never varicose, peculiarly short, (so that the length of the penult is to its breadth as two to five) and very numerous (we counted fifteen on rather a small individual). They are covered with spiral rows of very prominent rather large suborbicular concatenated granules (or small tubercles rather) of which there are two series of equal sized ones on each of the smaller volutions, and a third intermediate set of less (but gradually enlarging) ones on the lower coils. Three more spiral ribs that are equally prominent with the preceding, but which can scarcely be termed granular, are usually present on the body-whorl: the space between the two extreme ones (the last encircles the base of the canal) is somewhat broader than the previous intervals, and is smooth and slightly concave. In our most perfect example, the grains upon the body-whorl become narrow and elongated near the mouth of the shell. The basal attenuation is gradual, and but little rounded.

The mouth is very small and short, only occupying, exclusive of the recurved abbreviated yet decided canal in which it terminates anteriorly, about a sixth or a fifth of the entire length; it is squarish above, and broadly convex below. The outer lip, whose acute edge is more or less pallid or white, and is undulated by the external sculpture, is deeply and abruptly sinuated at the suture; its course is at first straightish, but abruptly rounding at the base it advances so as to overlap and close up the sides of the canal. The pillar is very solid, dark coloured, short, rounded, and furnished with a padlike reflection of the inner lip. The throat is quite smooth. The length of a large example was scarcely four lines and a half; the breadth was not quite one-third of this measurement.

A figure of Delle Chiaje, apparently representing this species, shows rather a short snout and thick tentacula, a rather long triangular foot, bearing a multispiral operculum. Lovèn gives an account of the animal of the genus *Triforis* drawn up apparently from this shell. He describes it as having a broad short head; long, cylindrical slender tentacula with subclavate tips, their bases remote but connected by a sinuated veil; eyes very shortly pedunculated (placed on bulgings) at their bases; operculigerous lobe single; mentum (fold in front of the foot) distinct; siphon short; operculum paucispiral, with a nearly central nucleus. In the present state of our knowledge we are unwilling to separate it from *Cerithium.*

More common in the south than in the north, but diffused with a westerly distribution from the Channel Isles to Zetland. It ranges from the Laminarian zone to as deep as fifteen and twenty fathoms; sometimes deeper. The localities for it are so generally those of other British *Cerithia* that the same enumeration will suffice: in the main it is scarcer. Very seldom taken alive: so rarely that we have never but once succeeded in obtaining it in a living state, and then on a rock at low water, in the Channel Islands, although dead and broken shells were abundant in neighbouring localities (S. H.)

It ranges from Norway to the Mediterranean, and was present in our area during the coralline crag epoch (Searles Wood).*

C. METULA, Lovén.

Pure white; whorls with three spiral granulated ridges, whose intervals are more or less distinctly clathrated.

Plate XCI. fig. 3, 4.

Cerithium metula, LOVÉN, Index Moll. Scandinav. (1846), p. 23.
„ *nitidum*, FORBES, Ann. Nat. Hist. vol. xix. (1847), p. 97, pl. 9, f. 2.

This interesting and rare shell was discovered about the same time in England and Norway. It is subulate, thin, and of a pure and uniform subvitreous white. There are from twelve to sixteen short volutions (more frequently thirteen), of which the apical coil and a half are smooth and bulbous. The next few turns are moderately rounded, and the rest quite flat; their lateral enlargement is moderate, their longitudinal increase is slow. The apex is fine, but is twisted to one side, so as to appear distorted and laterally subspiral. Three spiral ridges, which are rendered granular by numerous slanting longitudinal costellar lines, which form a rather depressed clathration in their intervals, traverse the whorls; one lying rather above the middle, one towards the top, and the third half-way between the subcentral one and the lower suture. The two lower ones are both larger and more projecting than the less distinct upper one, and this, coupled with a slight filiform submargination of the base (eventually appearing upon the body as a fourth subgranose or undulated ridge, below which the shell is horizontally compressed, and either smooth or merely marked with faint continuations of the longitudinal sculpture) gives a kind of subimbricating look to that portion of the volution, and causes the posterior end of the succeeding whorl to seem slightly concave. The mouth, exclusive of the rather short but decided and prominent canal in which it terminates anteriorly, and which bends abruptly to the left, is somewhat squarish in shape, rather longer than broad, and very small, occupying merely a fifth of the entire length, and about one-half only of the basal diameter. The outer lip is simple, acute, and nearly straight, forming an angle with the scarcely convex basal margin. The pillar is short, and devoid of sculpture, but is slightly raised at its anterior edge. The throat is apparently smooth, except from indentations caused by the external ridges. A third of an inch in length, and a tenth of an inch in breadth are the dimensions of our largest perfect example, but fragments indicate the attainment of the species to a somewhat larger size.

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* A shell is figured in Brown's "Illustrations" (pl. 5, f. 64) which in shape and look exactly resembles a worn aged shell of the present species, but is thus described (p. 9).

C. cancellatum, BROWN, "With eleven reversed, slightly defined volutions, tapering from the base to an obtuse apex; each volution provided with four rows of spiral, depressed tubercles, producing a fine cancellated appearance. These tubercles do not extend lower down than the upper margin of the aperture in front, and in a spirally parallel direction behind; aperture triangular, pointed beneath, ending in a compressed, closed, short canal; colour raw umber brown. Found on the Northumberland coast at Holy Island." If not an *adversum*, this is probably an exotic shell; neither Mr. Alder (whose list of Northumbrian Mollusks is a valuable contribution to Conchology, and not a mere local catalogue of species) nor any of our many correspondents are acquainted with it. The *C. minutissimum* of Brown (Ill. Con. p. 9) is solely derived from the *Murex minutissimus* of ADAMS (Trans. Linn. Soc. vol. iii. p. 65; from which, MONT. T. B. p. 273; MATON and RACK. Trans. Lin. Soc. vol. viii. p. 149; TURT. Conch. Dict. p. 97, &c.) A shell so meagrely defined that even the genus it belongs to must be purely conjectural.

It was first dredged in fifty fathoms water between Fair Island and the mainland of Zetland (E. F. and R. M‘Andrew). It has also been taken in eighty-two fathoms on the east coast of Zetland.

SPURIOUS.

C. COSTATUM, Da Costa.

Strombus costatus, DA COSTA, Brit. Conch. p. 118, pl. 8, f. 14. — PULTENEY, Hutchins, Hist. Dorset, p. 42. — DONOV. Brit. Shells, vol. iii. pl. 94. — MONT. Test. Brit. vol. i. p. 255; Suppl. p. 169. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 142. — RACK. Dorset Catalog. p. 46, pl. 14, f. 14. — TURT. Conch. Diction. p. 165. — DILLW. Recent Shells, vol. ii. p. 678.—WOOD, Index Testaceolog. pl. 25, f. 43.

„ *turboformis*, MONT. Test. Brit. Suppl. p. 110, pl. 30, f. 7.

Cerithium costatum, FLEMING, Brit. Anim. p. 357.—Brit. Marine Conch. p. 192. —HANLEY, Young Conch. p. 79.

„ *turbiforme*, FLEMING, Brit. Anim. p. 357.—Brit. Marine Conch. p. 193.

„ *Lafondii*, KIENER, Coquilles Vivantes, Cerith. p. 97, pl. 24, f. 3 (as of MICHAUD, Bull. Linn. Soc. Bordeaux, 1829, pl. 5, f. 7, 8, which we cannot now refer to).

„ *ambiguum*, ADAMS, Synopsis Conch. Jamaic. p. 4, (from types).

Turreted, simply tapering, rather thin, not polished, of an uniform chestnut brown when dead, but when alive of an iron grey, with the raised sculpture, especially in the middle of the whorls, of a paler cast, adorned with fine and somewhat curved longitudinal ribs that vary greatly as to strength and number (we counted seventeen on the penult turn of a characteristic example) but are always narrower than their intervals, and more densely disposed upon the lower volutions. These ribs sometimes extend the whole length of each whorl, but more frequently abruptly cease just before the profound or even excavated suture, that, for the most part, is surmounted by a single slightly raised generally interrupted spiral costella, which winds from the upper corner of the aperture to nearly the anterior base of the outer lip, and serves as a limit upon the body to the longitudinal ribs; the surface below it, when not traversed, as it often is, by an adjacent similar but less prominent threadlike line, is smooth or nearly so. Occasionally the continuity of the ribs is disturbed by two or three obscure spiral sulci which give them a slightly granular appearance. There are about eleven simply and moderately ventricose whorls, which are usually a little angulated above; they are not furnished with varices except a single broad white one that margins the outer lip of fully matured individuals. The mouth occupies about a fourth of the entire shell, has a roundish subquadrate shape, and is very nearly as broad as it is long. The edge of the much arcuated outer lip is at first incurved and then convexly projects towards the base of the shell. The throat is smooth. The pillar is nearly straight, and often pallid: there is no canal at its extremity but merely a sinus. Length fully five lines; extreme breadth a line and three quarters.

A common W. Indian shell; introduced by Da Costa as Cornish. The variety turboforme *was constituted from specimens in which the revolving basal thread was obscure, or not present, and the ribs coarser than usual; the advisability of suppressing it as a species was suggested by Montagu himself.*

C. SUBULATUM, Montagu.

Murex subulatus, MONT. Test. Brit. Suppl. p. 115, pl. 30, f. 6.—TURT. Conch. Diction. p. 96. — DILLW. Recent Shells, vol. ii. p. 759.— WOOD, Index Testac. pl. 28, f. 168.

Terebra subulata (not LAMARCK), FLEMING, Brit. Animals, p. 347.

Cerithium subulatum (not LAMARCK), Brit. Marine Conch. p. 194.

„ *elegans*, BLAINV. Faune Franç. Moll. p. 159, pl. 6, A. f. 9.—DESH. Anim. s. Vert. vol. ix. p. 323 (probably).

Subulate, tapering regularly from base to apex, not very strong, not varicose, pale squalid yellow, with a single very dark brown narrow band winding along the top of each turn, and passing slightly over the narrow suture; base of the body of a similar dark colour. Whorls very numerous (we counted fourteen on our largest example), extremely short, very slowly increasing in length, so flat that the lateral outlines of the shell are nearly rectilinear, adorned above and below with a row of horizontally compressed concatenated blunt granules, that are equally numerous, but slightly larger, on the base. The intervening central area, which to the eye seems smooth, is traversed by scarcely raised rounded longitudinal costellæ (one for each granule, and in continuous lines with them), and is at least half as long again as the larger grains: a very fine revolving line succeeds the upper series of granules upon two or three of the lower whorls in the larger individuals, and becomes slightly granular upon the body whorl. This last, which is furnished with an additional revolving belt, is angulated at the commencement of its basal declination ; its base is so compressed that it is flattened or even concave. The mouth is very small, about a fifth of the entire length, and somewhat square ; it terminates anteriorly in a rather short but decided canal ; the pillar is dusky, very strong, twisted, and, at its extremity, is rather obscurely and very minutely plicated across in a spiral fashion. The length is quite four lines, the breadth merely one.

A rather scarce W. Indian shell; introduced by Montagu as taken by Laskey in the Sound of Mull.

C. FUSCATUM, Linnæus.

LIST. Hist. Conch. p. 122, f. 20.
Murex fuscatus, LINN. Syst. Nat. ed. 12, p. 1225 (from type).—PULT. Hutchins, Hist. Dorset, App. p. 43. — MONT. Test. Brit. p. 269. — RACK. Dorset Catalog. p. 47.— TURT. Conch. Diction. p. 96.
Cerithium radula, BRUGUIÈRE, Encycl. Méthod. Vers, vol. i. p. 491. — LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 293.
Murex „ DILLW. Recent Shells, vol. ii. p. 754.
„ *granulatus*, WOOD, Index Testac. pl. 28, f. 160.
Terebra fuscata, FLEMING, Brit. Anim. p. 346 ?

A common African species; introduced by Pulteney as found after a violent storm on the shore near Weymouth. The Turbo tuberculatus *of Pennant (ed.* 4, *vol. iv. p.* 129, *pl.* 82, *f.* 111* copied, BROWN, Ill. Conch. pl. 5, f. 67) *from the Northumbrian coast, is generally, and with probability, regarded as a worn and imperfect individual of the same species.*

MELANIA MATONI, Gray.

LISTER, Hist. Conch. pl. 120, f. 15.
Murex fuscus, GMELIN, Syst. Naturæ, p. 3561 (in part).
„ *fuscatus*, MATON and RACK. Trans. Linn. Soc. vol. viii. pl. 4, f. 6 (no description).
Melania Matoni, GRAY, Miscel. Zoolog. p. 10.
„ *fusca*, PHILIPPI, Neue Conch. vol. i. p. 59, Melan. pl. 2, f. 1.

An African shell, figured by Maton and Rackett as from Weymouth.

SCALARIADÆ.

The wentle-trap, once famous for the enormous value set upon it by collectors, and always remarkable for its beauty, constitutes with its allies a small group, of which the genus *Scalaria* is the type. In this family a spiral shell with an entire aperture is combined with an animal whose head is not produced into a muzzle, but furnished with a retractile trunk. The sexes are distinctly separated. The eyes are immersed at the external bases of subulate tentacula. The dentition of the lingual riband is very peculiar; there is no central denticle, but transverse rows of teeth formed of unguicular, simple uncini. The animals of this family are probably predacious.

SCALARIA, Lamarck.

Shell spiral, pyramidal or turreted, firm, often strong in texture, ornamented with ribs, ridges, or varices, which cross the whorls in the direction of the length of the shell, smooth, or spirally striated between them. Mouth rounded, often subangulated below, lip thickened and entire. Operculum corneous, paucispiral.

Animal having an angularly lunated head, with two approximated long pointed tentacula; eyes immersed at their external bases; mouth inferior, with a retractile trunk; mantle a rudimentary siphonal fold, simlpe-edged;

foot obtusely triangular, not cirrhated posteriorly, grooved below, furnished in front with a fold or mentum.

Nearly one hundred species of this genus have been described. The majority inhabit tropical regions; the researches of Mr. Cuming among the Philippine Islands have made us acquainted with a great part of them.

S. TURTONIS. Turton.

Variegated; ribs depressed, mostly very narrow, but with a few broader ones intermingled; interstices with very fine spiral striulæ.

Plate LXX. fig. 1, 2.

Turbo Turtonis, TURT. Conch. Diction. p. 208, f. 97.
Scalaria Turtoni, FLEMING, Brit. Animals, p. 311. — COUCH, Cornish Fauna, pt. 2, p. 56.—Brit. Marine Conch. p. 157. — BROWN, Illust. Conch. G. B. p. 21, pl. 57, f. 7.—BLAINVILLE, Faune Française, Moll. p. 317.
,, *communis*, *var.* KIENER, Coquilles Vivan. Scalar. p. 13, pl. 4, f. 10, b.
,, *tenuicostata*, MICHAUD, Bull. Lin. Soc. Bordeaux, 1829, p. 260, f. 1.—BLAINV. Faune Française, Moll. p. 318.—POTIEZ and MICH. Galerie Douai, Moll. p. 345.—PHILIPPI, Moll. Sicil. vol. ii. p. 145.
,, *Turtonis*, SOWERBY, Thesaur. Conch. vol. i. p. 100, pl. 34, f. 106, 107, 108.—ALDER, Cat. Moll. Northumb. and Durh. p. 48.
planicosta, BIVON. Nuov. Gen. e Spec. Conch. pl. 2, f. 13 fide PHILIPPI, Moll. Sicil. vol. i. p. 168, pl. 10, f. 4. —DESH. Lam. Anim. s. Vert. vol. ix. p. 77.

Notwithstanding that the present shell approaches the succeeding in general aspect, its essential differences are of easy recognition. It is of a rather produced turreted form, strong, rather opaque, imperforate, moderately glossy, and indistinctly encircled, on a livid ground, with interrupted bands of chocolate-colour; of these, there are two on each whorl, and a third additional one near the base of the body, which exceeds the rest in breadth and intensity. The raised sculpture has, for the most part, a more fulvous cast. Exotic specimens are more frequently of an uniform chocolate-brown. About twelve depressed ribs, that instead of uniting in one continuous row with those of the previous or following volutions, spread out laterally above, run almost perpendicularly across the whorls, and reach the extreme base, which is not girt by any spiral belts or sulci. These cross-bars, as they are often termed, are simple, round-topped, and principally narrow and quite smooth, but mingled with them are also present some broader varices, that, from the longitudinal wrinkles upon them, look as though they were composed of two or more united costellæ. The broad interstices, although apparently smooth to the unassisted eye, exhibit most delicate and closely disposed spiral striulæ, when examined by a lens of the most moderate power. The number of turns ranges from twelve to sixteen, the former is the more frequent; they are rather short (their breadth being nearly twice their height), but little oblique, enlarge gradually but perceptibly, are moderately rounded but not swollen, and are closely connected to each other, their sutures not being excavated as in *communis*, &c. The aperture is rounded, oval, longer than broad, occupies about two-ninths of the total length, and rather more than half the basal diameter; it is neither oblique nor much projecting, and its peristome is considerably and nearly equally thickened throughout. The average length of British specimens does not exceed an inch and a half, and the breadth half an inch. Turton, however, mentions one which measured two inches and a half, by three-quarters of an inch. Mediterranean examples are much smaller and have usually only nine or ten cross-bars.

We have no note of the animal of this species. Its tongue is described by Lovén, who states that there are no axile teeth, but unguicular, somewhat broad, anteriorly produced, simple uncini.

It is a rare species, chiefly southern and western, though occurring off Whitburn (Alder); and Scarborough (Bean). It has been taken at Exmouth (Clark); Tenby (Jeffreys); Burrow Island and Laugherne (Barlee). Clyde province (E.F.). In Ireland it has occurred in a few localities, from Youghal (R. Ball) to the County Down northwards, on the eastern line of coast (W. Thompson); Cork and Bantry (Humphreys); Arran in Ireland (Barlee).

It ranges from Norway to the Mediterranean.

S. COMMUNIS, Lamarck.

Variegated; ribs prominent, oblique, of uniform size, their intervals quite smooth; sutures excavated.

Plate LXX. fig. 9, 10.

PLANCUS, Conch. Minus Notis, pl. 5, f. 7. — GINANNI, Opere Posth. pl. 6, f. 54.

Turbo clathrus, LINN. Syst. Nat. ed. 10 (not 12), p. 765 (partly).—PENN. Brit. Zool. ed. 4, vol. iv. p. 129, pl. 81, f. 111. — PULTENEY, Hutchins, Hist. Dorset, p. 45.—MONT. Test. Brit. vol. ii. p. 296; Suppl. p. 120, animal. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 170, var. α. — RACK. Dorset Catalog. p. 50. pl. 15, f. 11.—TURT. Conch. Diction. p. 207.—BORN, Testacea Mus. Cæs. Vind. p. 354. — DILLW. Recent Shells, vol. ii. p. 854. — WOOD, Index Testac. pl. 31, f. 90.

Strombiformis clathratus, DA COSTA, Brit. Conch. p. 115, pl. 7, f. 11.

Turbo clathratus, DONOV. Brit. Shells, vol. i. pl. 28, f. 1, 2, 3.

Scalaria communis, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 75.—Brit. Marine Conch. p. 156. — BLAINV. Faune Franç. Moll. p. 314.— DESH. Encycl. Méthod. Vers, vol. iii. p. 931, var. α. — PHILIPPI, Moll. Sicil. vol. i. p. 167, pl. 10, f. 3; vol. ii. p. 144. — KIENER, Coquilles Vivant. Scal. p. 12 (partly), pl. i. f. 2, and pl. 4, f. 10. — SOWERBY, Thesaur. Conch. vol. i. p. 85, pl. 32, f. 18, 19, 20.

Scalaria clathrus, Sowerby (not Dekay), Genera Shells, Scal. f. 2. — Fleming, Brit. Animals, p. 311.—Reeve, Conch. Systemat. pl. 210, f. 2.
Encyclop. Méthod. Vers, pl. 451, f. 3.

The name *clathrus*, although prior, cannot be retained, since Linnæus, after having most inadequately defined a species, so named in the tenth edition of his "Systema," bestowed the appellation, in his final edition of the same work, upon a very different exotic *Scalaria*.

To economize space we shall merely mention the chief particulars in which this well known species differs from the preceding. The shape is, for the most part, less produced, and whorls, which are usually but ten in number, are more oblique, and so profoundly separated from each other, as almost to appear disconnected. The cross-bars, of which there are generally from eight to ten, of uniform size on each volution, project beyond the suture, and attach themselves to those of the previous turn, so as to form several continuous series from the apex to the base. They are rather large and prominent, obliquely disposed, laminar, and not erect, but laterally reflected; their intervals are quite smooth. The colouring is whitish or pale fawn, variegated in the intervals of the costæ with purplish liver-colour, and spotted, band-fashion, upon the cross-bars, but these bands are not continued in the intervening spaces. There exists a small solid variety, on which the coloured markings are almost entirely obsolete, and the cross-bars are peculiarly thickened. In some of the Neapolitan examples, on the contrary, the colouring matter is so profusely disseminated, that the shell appears speckled with white on a ground of rich chocolate colour.

The dimensions are generally inferior to those of the preceding species.

The operculum is rather concave, ovate, with three volutions terminating in a nearly central nucleus.

The animal (which was long ago examined by Mr. Clark) has a short and broad head, with a vertically cleft centre, from which it protrudes frequently a long thick white retractile proboscis. The tentacles are long and slender, with eyes at their external angles on very slight bulgings, or nearly immersed. The foot is narrow, subtriangular, grooved beneath throughout its length, and bears on its caudal extremity a subspiral dark horny operculum, on a thin membranous lobe. The colour of the head, tentacles, and upper part of the foot, is blackish grey, mingled at the margins of the foot (which is white beneath) with a few white or pale yellow specks. Mr. Alder describes a specimen taken alive by him at Torbay, as having black tentacles, with the eyes on white spaces at their external bases, the head streaked above with black, as also the foot, which is slightly grooved down the centre. The operculigerous lobe is large and produced at the sides.

This, though widely distributed, is a scarce species. In the main it is southern; Margate (S. H.); and a single specimen from the fishing-boats at Cullercoats (Fryer, *fide* Alder), are instances of its occurrence on the east coast. Torquay (S. H.) in seven fathoms; Dartmouth (M'Andrew and E. F.); Exmouth (Clark); Plymouth, Shellness, North Devon, Tenby, Swansea (Jeffreys); Torbay (Alder); on both east and west of Ireland (Thompson); Cork (J. D. Humphreys); Bantry Bay (Jeffreys); Birterbuy and Arran in Galway (Barlee). A coloured variety with sharper ridges has been found near Swansea (Jeffreys); and at Exmouth (Clark).

It ranges to the Mediterranean, and is enumerated among Scandinavian species by Lovén.

S. CLATHRATULA, Montagu.

Uniform snow white; ribs extremely thin and very numerous, their interstices quite smooth.

Plate LXX. fig. 3, 4.

Turbo clathratulus, MONT. Test. Brit. vol. ii. p. 297; Suppl. p. 124. — TURT. Conch. Diction. p. 208. — DILLW. Recent Shells, vol. ii. p. 854.—WOOD, Index Testac. pl. 31, f. 92.

„ *clathrus*, var. β, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 171, pl. 5, f. 1.

Scalaria clathratula, FLEMING, Brit. Animals, p. 311. — CLARK, Zoolog. Journ. vol. iii. p. 343 (animal). — Brit. Marine Conch. p. 157.— BROWN, Illust. Conch. G. B. p. 21, pl. 8, f. 13. — BLAINVILLE, Faune Française, Moll. p. 317. — SOWERBY, Thesaur. Conch. vol. i. pl. 33, f. 47. — SEARLES WOOD, Crag Mollusca, p. 94, pl. 8, f. 19 (fossil).

„ *minuta*, J. SOWERBY, Min. Conch. pl. 390. f, 3, 4 (fossil).

„ *pulchella*, PHILIPPI, Moll. Sicil. vol. i. p. 168, pl. 10, f. 1; vol. ii. p. 145; KIENER, Coq. Vivant. Scalaria, pl. 6, f. 19?

This small and delicately fragile shell is of a produced turreted shape, of an uniform pure and glossy semitransparent white, and adorned with extremely numerous (we have counted twenty-two on the body-whorl) and remarkably thin, but not much elevated, simple longitudinal costellæ. Although laminar throughout, they exhibit, if possible, still greater tenuity at the top of each volution, where they are neither angular nor peculiarly prominent; they are scarcely at all oblique, and are divided by a profound and but little slanting sutural line. Their intervals are much broader, and quite smooth. The whorls, which commence in a fine but not much pointed apex, and gradually increase in length, are nine in number, of moderate roundness, and rather short, the width of them being more than twice their breadth. The body, for the most part, only occupies one-fourth of the dorsal length; the base is imperforate, well rounded, and devoid of any spiral carina. The aperture, which only constitutes one-fourth to one-fifth of the total length of the shell, has a rounded oval contour; no external angulation is effected by the junction of the outer with the pillar-lip. The peristome is not otherwise thickened than by the lamina at the back of the outer lip; the shelly substance is thinly spread upon the pillar-lip posteriorly, but in front it is more solid, and the pillar becomes dilated and reflected at the base of the shell. Our largest example is not half an inch in length, and the majority of individuals do not much exceed four lines and a half.

The animal of *clathratulus* has been observed by Mr. Clark and by Mr. Alder. In most of its features it resembles that of *Scalaria communis*, but has a more slender foot and shorter, more obtuse tentacula. It is entirely transparent white, speckled with opaque flakes of the same hue. The anterior margin of the foot is deeply grooved, the posterior extremity tapers to a slightly rounded termination, and carries, on a simple lobe, a white operculum of two very small and one very large whorls. The hinder half of the sole of the foot is grooved longitudinally and medially by a deep central depression.

This is a southern species and rare. It occurs at Herm (S. H.); Devon (Clark); Torbay, Fowey and Falmouth (Alder); Penzance (E. F.); off Lundy Island (M'Andrew); South Wales (Jeffreys and Barlee). In Ireland it occurs on east and west coasts in a few places (Thompson); Cork harbour and Bantry Bay (Jeffreys); Kilkee in Clare (Humphreys); Arran in Galway (Barlee).

In the coralline crag of Sutton (Searles Wood).

S. GRŒNLANDICA.

Ribs separated by spiral ridges.

Plate LXX. fig. 5, 6.

Turbo clathrus Grœnlandicus, Chemn. Conch. Cab. vol. xi. p. 155, pl. 195, f. 1878, 1879.
Scalaria planicosta, Kiener, Coquil. Vivant. Scalaria, p. 18, pl. 7, f. 21.
„ *subulata*, Couthouy, Boston Jl. Nat. H. vol. ii. p. 93, pl. 3, f. 4.—Dekay, New York Fauna, Moll. p. 125, pl. 6, f. 125.
„ *Grœnlandica*, Gould, Invert. Massach. p. 249, f. 170*.—Searles Wood, Crag. Mollusca, p. 90, pl. 8, f. 11 (fossil).
„ *Greenlandica*, Sowerby, Thesaur. Conch. p. 101, pl. 34, f. 105, 110.
„ *similis*, J. Sowerby, M. Conch. pl. 16 (fossil).

As only a fragment or two of this strongly featured *Scalaria* has been taken in Great Britain, we have been compelled to have recourse to foreign specimens, for our drawing and description of this boreal species. The shell is of a somewhat produced turreted form, strong, almost opaque, or only a little translucent, of an uniform chalky white, livid brown or bluish white tint, and never either zoned or variegated by coloured markings; the ribs, however, are often of a paler hue in the more lurid examples. From eight to fifteen broad, simple, stout, flattened, and not much slanting ribs, of which one or two on the last few whorls are somewhat bigger than the rest, traverse the surface in a longitudinal direction; on the upper turns, however, they are mere lamellæ. Their intervals, which, considering the breadth of the ribs, are rather narrow than otherwise (yet always much wider than the cross-bars themselves) are occupied by from six to eight spiral ridges, that are rounded, rather depressed, and closely packed. The terminal one upon the body is bigger than the rest, and running from the posterior end of the aperture, leaves somewhat larger intercostal intervals, than those allowed by the closeness of the preceding ridges. These small areas are either smooth, or merely roughened by longitudinal wrinkles, which latter are frequently present at the base of the cross-bars likewise. There are nine or ten whorls, which although somewhat flattened in surface, are nevertheless profoundly and rather abruptly impressed at the sutures, hence they are apt, at times, to assume a slightly scalar appearance; they are in close contact (the superior ones are rather more loosely coiled), rather short, the height being about half the breadth, and neither quickly enlarging, nor peculiarly oblique. The body, or final volution, occupies, when examined dorsally, about one-third, when inspected ventrally, about three-sevenths, of the total length: its base is rather short, imperforated, and somewhat flattened. The aperture, which is of a rounded oval figure, is equal to one-fourth of the total length, and about four-sevenths of the basal diameter. The external edge of the pillar-lip, which is convex, very broad, and remarkably appressed, forms a tolerably distinct angle with that of the outer lip. Specimens are said to attain to two inches and a half in length, a size far beyond than of any individuals that have attracted our notice.

Although hitherto merely fragments of this shell have been discovered in our waters, the very peculiar character of the sculpture at once indicated the species of which they formed a portion.

Mr. M'Andrew has added this species to the British Fauna, having dredged the fragments above alluded to in thirty-eight fathoms water off Duncanby Head, on the north coast of Scotland. They have all the appearance of being recent. It is a boreal and arctic form, and is well known as a pleistocene fossil.

S. Trevelyana, Leach.

Of an uniform orange pink or pale fawn colour, never pure white; no spiral sculpture; ribs not quite laminar, though narrow, usually about twelve, never exceeding seventeen.

Plate LXX. fig. 7, 8; and (Animal) Plate F F, figs. 1 to 3.

Scalaria Trevelyana, Leach, in Raine's Durham (no description). — Winch, Annals Philosoph. vol. xx. (1822, New Series, vol. iv.) p. 434. — Thompson, Ann. Nat. Hist. vol. v. p. 245. — Johnston, Berwick. Club, vol. i. p. 263.—Maclaurin, Berwick Club, vol. ii. p. 40. — Brit. Marine Conch. p. 254, f. 27.—Alder, Cat. Moll. Northumb. and Durh. p. 48.—Sowerby, Thesaur. Conch. vol. i. p. 100, pl. 35, f. 129.—Lovén, Index Moll. Scan. p. 16.—Searles Wood, Crag Mollusca, p. 94, pl. 8, f. 20 (fossil).

The name *Trevelyana* appears to have first been published in "Raine's Account of Durham," and although the *Scalaria* to which it was applied, was neither defined by figure nor language, its specific individuality was recognised, and the traditional epithet preserved in the cabinets of our northern collectors. The merit then of having constituted this very distinct species, is conceded to Dr. Leach by the courtesy of those who have described it, but had any writer in the interim between its simple indication and comparatively recent description, adequately defined it under a different appellation, the name of the later author must have been preferred.*

The shell is simply turreted, not very strong or transparent, and of an uniform glossy pink cream or fawn colour. From twelve to seventeen smooth, simple, not much elevated, ribs, that are mostly narrow, with here and there a somewhat broader one intermingled, traverse each whorl in a longitudinal direction, but neither form continuous series extending from the apex to the base of the shell, nor surmount the cross-bars of the preceding volution. They are rather more solid below, and more elevated, reflected, and laminar above, where they are not at all appressed, but terminate somewhat abruptly and subrectangularly. Their intervals, which are nearly smooth (yet extremely fine distant spiral impressed lines, and obsolete longitudinal close-set wrinkles, are here and there apparent), are, upon the larger turns, twice, or even thrice the breadth of the ribs themselves. The whorls, which range from nine to twelve, are rounded, rather short, the height not being above half the breadth, and of slow enlargement. They are but little oblique, and are well defined by a very deep suture, which is not filled up (as in certain *Scalariæ*) by any appression of the cross-bars. The body, in middle-sized individuals, occupies one-third of the dorsal length of the shell; its base is imperforated, devoid of any spiral ridge, and is somewhat flattened; hence the front of the aperture appears rather projecting. The mouth is rounded-ovate, and occupies one-fourth of the entire length, and full four-sevenths of the basal diameter; the peristome is unequally thickened, the lower or anterior end of the pillar-lip, which is not appressed, but reflected, being rather the broadest portion. The arcuated outer lip is a little flattened anteriorly, and forms a slight angle with the columella. The examples we have described from do not exceed three quarters of an inch in length, and do not exhibit the highest number we have mentioned of either whorls or ribs. A pale rose-coloured specimen of nearly twice this size is mentioned by Mr. Maclaurin in his Appendix to Dr. Johnston's interesting account of the Mollusca of Berwickshire.

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* In justice to the memory of Dr. Leach, we must remark, that his manuscript names were not bestowed on that haphazard appropriative principle that seems to actuate certain curators of the minor continental museums, but were those actually applied by him to the several objects in his intended large work upon the Mollusca of Great Britain, of which we have seen the unpublished proofs of about one hundred pages, and about nine or ten engravings.

The animal, which we have examined in the Zetland Seas, has long and pointed tentacula with conspicuous eyes immersed in bulgings or rather swellings at their external bases. The mantle forms a distinct fold opposite the lower angle of the mouth. The foot is rather narrow, obtusely triangular, and, as in the other species of this genus, is often carried considerably in advance of the head. The body, head, and foot are white; the tentacula are of lilac purple, except their bases, which are white; the operculum is very dark brown, or nearly black. Mr. Alder describes a Northumbrian example of this animal as being flesh-coloured, spotted with opake white; the tongue has the denticles more slender and more curved than those of *S. Turtonis* represented by Lovén.

This is a northern species, and when found southwards, as off the south-east coast of Ireland, occurs only on the boreal outliers. It was first observed on the Northumberland coast, where, according to Mr. Alder, it is rather rare in the deepest water of the coralline zone. Shields (G. B. Sowerby); Scarborough (Bean); Berwick (Johnston); in twenty-five fathoms off the Coquet; in fifteen fathoms, Eda Sound, in forty fathoms, shelly bottom on the east coast, and fine specimens in from eighty to one hundred fathoms, on an oozy bottom, west coast of Orkney (Thomas); in eighty and eighty-two fathoms, sand, alive, and in ninety and one hundred fathoms, dead, Zetland (M'Andrew and E. F.) Magilligan on the north coast of Ireland, and in the south at Cork (found by Mr. J. D. Humphreys), (Thompson). Off Mizen Head in fifty-six fathoms, dead; on the Nymph Bank, alive in fifty and fifty-five fathoms, sixty miles from shore, and in sixty fathoms off Cape Clear (M'Andrew).

Out of Britain it is recorded as a Scandinavian species by Lovén. As a fossil, Mr. Searles Wood describes a single specimen from the red crag of Sutton, and Lieut. Thomas informs us that he dredged up two crag specimens in the Wold on the coast of Norfolk.

SPURIOUS.

VERMETIDÆ.

Of this family, the true position of which is not exactly in this place in the system, we have no British examples. The European species are Mediterranean and Lusitanian. It is mentioned here on account of having, once, by mistake, found, through a spurious representative, a place in the British Fauna.

The *Vermetus* introduced as *Turbo pentangularis* by Brown in the "Memoirs of the Wernerian Society" (vol. ii. pt. 2, p. 522, pl. 24, f. 7, 8), has been subsequently withdrawn, as exotic, by the author himself.

PYRAMIDELLIDÆ.

This family consists of a group of *Gasteropoda*, which, so far as shell is concerned, closely resembles *Rissoa* and its allies, consisting chiefly of turreted species, sometimes smooth, often polished and shining, not a few beautifully ornamented with spiral and transverse sculpturing; their apertures are entire and not produced into a canal below; many of them have plications on the pillar-lip. The animal which constructs these shells is, however, very distinct, being furnished with a retractile proboscis like *Scalaria*, and having tentacles variously formed, bearing eyes immersed at their bases. The tongue is remarkable for being unarmed, a character which in all probability holds good throughout the tribe. The *Pyramidellidæ* present subjects of much interest to the student of extinct Mollusca, numerous forms bearing all the aspect of being members of this family, occurring among the fossils of even the oldest stratified rocks. Many of them are gigantic compared with existing species, and the group, as a whole, may be regarded rather as appertaining to past ages than to the present epoch.

ACLIS. Lovén.

Shell turreted, many-whorled, smooth or spirally striated, rarely with longitudinal striæ; mouth oval or rounded, pillar-lip without folds, base often perforated. An operculum.

Animal (according to Lovén) with slender cylindrical tentacula, which are slightly swollen at their tips, and have approximated bases, near the outer sides of which the eyes are immersed; the mouth is furnished with a long retractile proboscis; the tongue is probably unarmed; the foot is linguiform, truncate in front, where it is surmounted and preceded by produced mentum; the operculigerous lobe is ample, developed more on the right side, where it is three or four plicated, than on the left, where it forms a single rounded lobe.

This genus was founded by Lovén for a shell which appears to be congeneric, if not identical, with the *Turbo ascaris* of British authors. As yet the animal has been met with by the Swedish naturalist only, and his account of it places the type without doubt in the immediate neighbourhood of *Eulima*. With it we have associated a small group of shells which have been variously placed in other genera, usually in *Chemnitzia*, but which have the ovate or rounded mouth and tumid volutions characteristic of the shell of *Aclis*. Mr. Searles Wood has used the name *Alvania*, proposed by Leach, for this genus; but judging from Mr. Gray's "List of Genera," the synonomy of *Alvania* is doubtful, and certainly, as used by Risso, it became but another term for *Rissoa*. We prefer accordingly adopting the clearly defined and well-founded genus proposed by Lovén.

The genus *Mesalia*, of Gray, has close relations with *Aclis*, but its true position and value can hardly be made out at present.

A. ASCARIS, Turton.

Rather slenderly turreted, spirally ridged throughout : suture oblique ; mouth oval : axis imperforate.

Plate LXXXVIII. fig. 8.

Turbo ascaris, TURT. Conch. Diction. p. 217.
Alvania supranitida, SEARLES WOOD, Catal. Crag Moll. (teste S. W.)
Turritella ascaris, HANL. Brit. Marine Conch. p. xlv. f. 21 (magnified, worn).
Pyramis acutissimus, BROWN, Illust. Conch. G. B. p. 15, pl. 9, f. 36 ?
Aclis supranitida, LOVÉN, Index Moll. Scand. p. 17 (probably ; no description).

So rare is this minute but elegant species that we have never seen more than three or four specimens of it. It is of a tapering and rather slender turreted shape, thin, and of a pure uniform white ; its lustre and transparency we cannot speak of, not having examined the shells of living examples. It is spirally ridged, with rather square-topped narrow regular and equidistant ribs, whose intervals are smooth, and sometimes twice as broad as the raised sculpture. These ridges, which seem to continue, though less prominently so, to the base of the body, are five in number upon the penult and antepenult turns. The uppermost one is occasionally rather less distinct than the rest ; the lowest one is very near the oblique sutural line, which, owing to the roundness of the volutions (about eight in number) and the profundity of their slant both above and below, is very strongly pronounced, though not canaliculated. The longitudinal increase of the volutions is rather quick ; the body is attenuated below, its basal declination is gradual and rounded. The mouth is of an obliquely oval shape, and occupies about a fourth of the entire length : it is about half as long again as it is broad ; is somewhat rounded, and not wide at the anterior base, and is chiefly prominent at the posterior extremity. The outer lip is simple, but not thin, juts out rather abruptly above, does not expand, and is not sinuated in outline. The pillar-lip is moderately broad, reflected, but not closely appressed, is long, smooth (as is likewise the throat) and not much curved. The peristome is scarcely continuous, but no angle is formed by the pillar (as in *Turritella*) with the base of the penult turn. There is no distinct umbilicus, but at most a chink. The specimen we have chiefly described from does not exceed the seventh of an inch in length.

All we know of the animal is contained in the generic character, cited by Lovén.

Turton first took it at Seafield in Ireland; it has since been taken in that country by Mr. Warren and Mr. Alder on the east coast, and by Mrs. Hancock at Bundoran on the west (W. Thompson); Burrow Island (Rev. J. M. Beevor); Tenby (Jeffreys). In eighty-two fathoms, on sand, east of Zetland (M'Andrew). Some of these localities may belong to the succeeding shell, whose identity with the present will probably hereafter be determined by the discovery of intermediate examples.

A. SUPRANITIDA, S. Wood.

Turreted-subconical, smaller whorls, spirally ridged; lower turns either wholly smooth, or smooth upon the upper third of each; mouth rounded oval; axis widely umbilicated in the adult.

Plate XC. f. 2, 3.

Alvania supranitida, SEARLES WOOD, Catal. Crag Moll.
„ *ascaris*, SEARLES WOOD, Crag Moll. p. 99, pl. 12, f. 11.

We are indebted to the late Mr. Lyons of Tenby, for the gift of some examples of this remarkable species, which

Montagu had proposed to call *Turbo perforatus*. In general, the surface as it is found in cabinets is worn to a state of smoothness, in these the sculpture is most distinct. The shape is turreted-subconical, the spire rapidly tapering to a very fine point, which, however, is not simple, but distorted, as in the *Chemnitziæ*. The shell is thin, glossy, slightly translucent, and of an uniform white; its earlier volutions (the apical ones excepted) are adorned with three narrow spiral ridges, which in one of our examples continue throughout ten of the coils, but more frequently are visible upon three or four alone; indeed, from the abrasion of the majority of specimens it is difficult at times to perceive more than the traces of their former presence. The upper third at least of the ridged volutions is quite smooth, as are likewise the narrow intervals of the costellæ; there seem, however, vestiges, in certain examples, of some obscure longitudinal pliciform wrinkles upon the posterior portion of some of the last formed turns. In our largest specimen, which measured three-tenths of an inch in length, and about one-tenth in breadth at the base, we counted twelve whorls: they are moderately rounded, short, of rather quick lateral, but slow longitudinal enlargement, slightly more tumid below than above, and divided by a profoundly impressed but not canaliculated suture, which is, perhaps, rather less oblique than in the majority of shells. The basal declination of the body is rounded, but rather abrupt; the body itself is swollen, but so far horizontally compressed (not flattened), on the ventral side, as to show a kind of excavated space behind the pillar leading to the very large and open umbilicus, which perforation is, however, disproportionately small in the immature examples. The mouth, which occupies about two-sevenths of the total length, has a rounded oval contour, is not dilated, but projects anteriorly without forming any peaked extremity. The peristome is continuous, or very nearly so. The outer lip is simple, acute, and much arcuated; its edge advances towards the base. The pillar-lip is thin, narrow, rather elongated, curved, and erect; it curls slightly back, but is neither appressed, nor decidedly reflected.

The animal has not been met with.

We regard the species as very rare, a specimen or two only having been obtained in each locality during each research. Our best was dredged between Guernsey and the adjacent islet of Herm; the coral sand of Bantry Bay supplied us also with a few individuals (S. H.); Devon, Tenby, Swansea, and Dublin Bay (Jeffreys).

A. UNICA, Montagu.

Aciculate; with longitudinal costellæ, and spiral striæ.

Plate XC. fig. 4, 5.

Turbo unicus, MONT. Test. Brit. vol. ii. p. 299, pl. 12, f. 2.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 174.—TURT. Conch. Diction. p. 209. —DILLW. Recent Shells, vol. ii. p. 860.—WOOD, Index Testaceolog. pl. 31, f. 108.

Turritella unica, FLEMING, Brit. Animals, p. 303.—Brit. Marine Conch. p. 190, f. 35.

Pyramis unicus, BROWN, Illust. Conch. G. B. p. 14.

Chemnitzia unica, ALDER, Cat. Moll. Northumb. and Durh. p. 49.

This extremely fragile shell is aciculate in shape, tapering, very thin, and of an uniform more or less shining semipellucid snow-white hue. There are nine peculiarly rounded whorls, that enlarge with moderate quickness, are rather high, the height being usually to the width as two to three, are strongly defined, but only separated by a delicate and very oblique suture; the body viewed dorsally occupies about three-fourths of the length; if examined ventrally, scarcely one-third; the apex is moderately pointed. The sculpture consists of extremely numerous but not crowded, fine, and somewhat curved, longitudinal costellæ, whose broader intervals are crossed by still finer close-set spiral striæ, which latter likewise, under the microscope, appear to be elevated. The base, which is not compressed, but gradual in its slope, is rounded, and in fresh individuals is not smooth, but exhibits a continuation of the preceding sculpture, of which the spiral lines are the more manifest: there is no perforation of the axis. The aperture, were it not for the interruption of the body, would be oval; it occupies about one-fifth of the entire length of the shell, and fully one half of the basal diameter. The outer lip is simple, acute, and well rounded in front; the pillar is simple, gently curved, and not distinctly reflected. The ordinary length is at most the seventh of an inch.

The animal is unknown.

S. Devon (S. H.); Falmouth, Sandwich, Tenby, Swansea, and adjacent bays (Jeffreys); Scarborough (Bean); Northumberland (Alder); Cork harbour, and elsewhere, in Ireland (Thompson).

A. NITIDISSIMA, Montagu.

Aciculate, smooth or with microscopic spiral striulæ: no longitudinal sculpture.

Plate XC. fig. 6, 7.

Turbo nitidissimus, MONT. Test. Brit. vol. ii. p. 299, pl. 12, f. 1.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 175.—TURT. Conch. Diction. p. 217.

Turritella nitidissima, FLEMING, Brit. Animals, p. 304.—Brit. Marine Conch. p. 190, f. 17 (badly).

Pyramis nitidissimus, Brown, Illust. Conch. G. B. p. 15.
Chemnitzia nitidissima, Alder, Cat. Moll. Northumb. and Durh. p. 49.

Although smooth to the naked eye, and represented as such by the earlier writers, the surface of this shell, when not abraded, displays beneath the microscope an exquisitely delicate spiral lineation.

This graceful little species is very slenderly subulate, almost indeed aciculate, extremely thin, and of an uniform glossy and transparent snow white. Besides the heterostrophe apical coil, which is narrow and prominent, there are eight volutions, which are most minutely and densely striated throughout in a spiral direction, are of slow longitudinal increase, and more or less high, the proportion of length to breadth in the penult turn being sometimes as three to four, sometimes as five to eight. They are moderately, but decidedly, ventricose, and almost equally rounded above and below: the suture that divides them is profound and slanting, or at least moderately oblique. The body, whose axis is imperforated, is rounded at the base, but its declination is rather quick. The mouth, which occupies a fifth of the entire length, is simply oval, and is not distinguished by any sculpture. The outer lip is acute, simple, and not expanded; the receding pillar-lip is curved, narrow, and not distinctly reflected. Two lines is the full length of individuals whose basal breadth is but the fifth of that measurement.

The animal has not yet been observed, nearly all the examples of this rare species having been procured from shelly sand. Dr. Johnston has taken it at Cheswick (Alder), which is almost the only recorded northern locality. Padstow (Rev. W. Molesworth from Dr. Goodall); Falmouth, and Cork Harbour (Jeffreys); Exmouth

(Clark); and Burrow Island (S. H.), have likewise furnished it to collectors.

STYLIFER. Broderip.

Shell subglobose or conical, smooth and polished, many-whorled, the apex produced and styliform. Mouth subovate, acuminated above, rounded below; pillar-lip curved, smooth. No operculum.

Animal with slender, cylindrical tentacula, the eyes small and immersed at their external bases. Mantle (according to Broderip) thick, fleshy, reflected on the last whorls of the shell; foot ample, long, linguiform, produced and provided with a conspicuous mentum in front; tongue unarmed. A single branchial plume.

We are indebted for the first account of this most curious animal to a highly accomplished British naturalist, who has done much good service to malacology. The anomalous shell termed *Phasianella stylifera* by Turton, was the first species discovered; it was placed in *Velutina* by Dr. Fleming, who, however, predicted its probable generic importance, and suggested the name *Stylina*. Among the discoveries of the indefatigable Hugh Cuming, were several species congeneric with the British shell, and like it parasitic on Echinoderms. The animal of one of these was fortunately preserved. Since then the creature has been observed and delineated when alive by Mr. Arthur Adams, a gentleman whose researches during the later voyages of Sir Edward Belcher have given him a worthy place among British naturalists, and on our own shores by Mr. Alder.

M. Alcide d'Orbigny in his "Paléontologie Française," has suggested the union of *Stylifer* with *Eulima*, and has speculated on the possible parasitic nature of the latter genus. The habits and structure of *Eulima* are, however, sufficiently distinct.

S. Turtoni, Broderip.

Plate XC. fig. 8, 9, and (Animal) Plate O O. fig. 5.

Phasianella stylifera, Turton in Zool. Journ. vol. ii. p. 367, pl. 13, f. 11.—Brit. Marine Conch. p. 186.—Brown, Ill. Conch. G. B. p. 10.
Velutina „ Fleming, Brit. Anim. p. 326.
Stylifer Turtoni, Broderip, Zool. Proc. 1832, pt. 2, p. 61; Penny Cyclop. vol. xxiii. p. 179.—Alder, Moll. Northumb. and Durh. p. 45, animal.
„ *globosus*, Johnston, Proc. Berw. Club, vol. i. p. 275.
„ *stylifera*, Brit. Marine Conch. p. XLIV.
„ *astericola*, Brown, Ill. Conch. G. B. p. 133, pl. 10, f. 40, 41.

This, the only species of its genus, that has yet been found in the European seas, is a small nearly globular perfectly smooth transparent glossy and very thin shell, rarely exceeding a little more than one-tenth of an inch in length, and a slightly less diameter across the body-whorl. It is of pale yellowish horn-colour, and occasionally has a tinge of rufous towards the pillar-lip. There are about five volutions; that forming the body-whorl is very ventricose, and large in proportion to the others, constituting the great bulk of the shell; the second is comparatively small, and varies in dimensions in different specimens; the third is very much less, and is also variable, generally it is not longer than the terminal volutions, and with them forms a curious styliform process constituting the apex of the shell. The apical whorl is sometimes set obliquely but is not reversed. The suture dividing the whorls is strongly marked. The aperture is rounded ovate and entire; it occupies two-thirds of the length of the body-whorl; the peritreme is incomplete, and has a very thin margin; at its superior junction with the body it is slightly appressed and unites with it at a rather acute angle; below, it widens out, and in the lowest part is rounded with a slight obliquity towards the axis. The pillar-lip is prominent, very slightly thickened or marginated above, becoming thinner below; it is slightly reflected, and there is no trace of an umbilicus.

The only account of the animal is contained in Mr. Alder's Catalogue of the Mollusca of Northumberland and Durham. "We lately obtained a specimen of this species alive on the spines of an *Echinus* at Cullercoats, but rather injured and in a very sickly state. We placed it in a glass of fresh sea-water, hoping that it might recover and display itself more distinctly; but in this we were disappointed, as it soon died, and being left unlooked for awhile, had partially decayed. The animal was white, had a rather large foot, without operculum, and a rounded head with two cylindrical tentacles and minute eyes at the (external or posterior) base. No portion of the shell was covered by the fleshy parts, but we are not prepared to say, that, in a state of vigour, the animal has not the power of extending some part of the mantle or foot over it." We have seen the preserved specimen.

It was first discovered on the spines of *Echinus sphæra* at Torbay. Dr. Johnston has taken it in a similar situation at Berwick, and Mr. Alder and Mr. R. Howse on the coasts of Northumberland and Durham. Mr. Jeffreys has it from Cork, where it was taken by Mr. J. D. Humphreys. It must be regarded as a very rare shell; we have never met with it, though seldom has an *Echinus* past through our hands without a search being made for the

Stylifer.[*] Mr. Alder informs us that it occurs on young sea-urchins. The exotic species bury themselves in the skins of star-fishes.

EULIMA. Risso.

Shell elongated, lanceolate or subulate, surface smooth, polished; spire produced, many-whorled, apex acute; mouth ovato-pyriform, pointed above, rounded below; pillar-lip gently curved, smooth; pillar imperforate; operculum subpyriform, corneous, imperfectly spiral.

Animal with two subulate tentacula, having conspicuous eyes immersed at their posterior bases, which are approximated; mouth furnished with a long retractile proboscis; tongue unarmed; foot linguiform, produced in front, where it is truncated, and doubled above the frontal margin by a bilobed mentum or fold; the operculigerous lobe developed at the sides into more or less ample even-edged unequal expansions or lobes. Branchial plume single. Mantle with a rudimentary branchial fold. Male organ small, flat, falcate. All the animals of this genus creep with the foot greatly in advance of the head, which is almost always concealed beneath the edges of the aperture of the shell, the tentacula only protruding.

More by chance than through knowledge, Risso, whose writings have done much to confound and obscure malacology, proposed a good genus in *Eulima*, a group of mollusks remarkable for the beauty and delicacy of both their hard and soft parts. Species are now known from most seas, and as the deeper waters are more and more submitted to exploration the number will doubtless be considerably increased. In the fossil state many *Eulimæ* are met with, even in the older formations.

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[*] Mr. Jeffreys informs us that the *Stylina stylifera* of Macgillivray (Moll. Aberd. p. 343) was described from a young exotic, *Bulimus* (!) that had been picked up with *Columbella mercatoria*.

The animal of *Eulima* was first made known by Philippi. It has since been examined and described by several malacologists. Yet, strange to say, by more than one recent writer it has been treated as amongst those imperfectly understood groups of which only the shell has as yet been made known.

E. POLITA, Linnæus.

Moderately large, lanceolate, solid, uniform white, scarcely at all arcuated, not compressed: mouth ovate or oval, but peaked above.

Plate XCII. fig. 1, 2, 3, and (Animal) Plate K K. figs. 2 and 3.

Helix polita, LINN. Syst. Nat. ed. 12, p. 1241 (probably). — PULTENEY, Hutchins, Hist. Dorset, p. 49. — MONT. Test. Brit. vol. ii. p. 398; Suppl. p. 141 (chiefly). — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 210.—RACK. Dorset Catalog. p. 55, pl. 19, f. 15.

Strombiformis albus, DA COSTA, Brit. Conch. p. 116.

Turbo albus, DONOV. Brit. Shells, vol. v. pl. 177.

„ *politus*, TURT. Conch. Diction. p. 217 (chiefly). — DILLW. Recent Shells, vol. ii. p. 881.—WOOD, Index Testac. pl. 32, f. 159.

Rissoa Boscii, PAYREAUDEAU, Moll. Corse, p. 112, pl. 5, f. 15, 16.

Phasianella polita, FLEMING, Brit. Animals, p. 301.

Melania Boscii, PHILIPPI, Moll. Sicil. vol. i. p. 157.

Eulima Anglica, SOWERBY, Zool. Proc. 1834; Conch. Illust. Eul. f. 8.

„ *polita*, Brit. Marine Conch. p. 187, f. 49.—BROWN, Illust. Conch. G. B. p. 14, pl. 9, f. 59, 60. — DESH. Lam. Anim. s. Vert. vol. viii. p. 453.—REEVE, Conch. Icon. pl. 209, f. 5.—PHILIPPI, Moll. Sicil. vol. ii. p. 134. — SEARLES WOOD, Crag Mollusc. vol. i. p. 96, pl. 19, f. 1 (fossil).

The chief character by which the shells of this genus are distinguishable from each other is the proportion of their parts. For all the species are alike lustrous, smooth, and flat-surfaced, and very few of the known species are otherwise than snowy white. Hence considerable difficulty must ever exist in ascertaining the exact limits of each species, and indicating them by language.

The present shell, by far the largest of our British species, is lanceolate, with a moderately broad base, the average length being to the breadth as three to one, or seven to two. It is never much arcuated, though often slightly so in its upper volutions and earlier stages of growth. It is strong, perfectly smooth, highly polished, not compressed, and of an uniform ivory or cream white, that often displays, from the semi-transparency of the earlier turns—the lower whorls are opaque from their superior solidity—the various hues of the animal inhabitant. The spire, whose sutural line is perceptible enough for the genus, and a little slanting, consists of about eleven whorls, that are not absolutely flat, though very nearly so, are of slow longitudinal increase, of moderate enlargement in breadth (in the earlier turns, for the body and penult are almost subcylindrical) and moderately short, the dorsal breadth of the penult being just twice its length. The body is half as long again as the preceding turn, and occupies about two-sevenths of the total length; its basal declination in the adult is very gradual and moderately rounded. The mouth, which scarcely fills one-fourth of the entire length, is acuminated above, but is otherwise oval, and not attenuated, but moderately rounded below. The outer lip is rather thickened, and is either straightish or very slightly sinuous above; it arches and advances below, where it pouts out more or less towards the base.

The inner lip is rather broadly reflected over the pillar, which latter occupies one half of the length of the mouth, and forms an angle with the base of the last turn. Our largest example measured thirteen lines long, and was three lines and a quarter in breadth.

An abbreviated variety is taken in the North, which differs from the more characteristic individuals, in the greater rapidity with which the shape widens, and the consequently less cylindraceous shape of the body-whorls, and greater abruptness of the basal declination. The suture is rather more indistinct.

Notwithstanding the very different look of the more strikingly dissimilar Loch Fyne specimens, that are usually termed *nitida* by collectors, and which somewhat resemble the shell so named by Philippi (Moll. Sicil. vol. i. pl. 9, f. 17), but not the original figure in the "Annales du Musée" (vol. viii. pl. 60, f. 6), which is very much more slender, we are unable to discern any absolutely permanent characters of sufficient importance to authorize their separation from *polita*. They are generally, however, more regularly subulate (yet variable as to relative length and breadth), as the body is rather less cylindraceous. The suture, besides, is more horizontal, and more clearly pronounced, the whorls, especially the final one, more disposed to convexity, and the outer lip more symmetrically arcuated.

The animal has a rather narrow head, flanked by two subulate tentacula with approximated bases, upon which are borne the conspicuous sessile eyes, a little to their outer sides; on one side of the neck in the males is a small, slightly falcate, flattened process. The mantle is even-edged, and opposite to that part of the lip of the aperture of the shell which corresponds to the canal in the siphonated univalves, it is slightly produced and formed in a very rudimentary respiratory fold. The foot is long and much produced in advance of the head, and margined by a bilobed mentum or frontal fold; it is angulated, but not acutely, in front, and obtusely pointed behind. The sides bear two unequally developed, rather obscure lateral lappets, homologous with the winged processes of the sides of the operculigerous lobes in *Rissoa*. The operculum is horny, yellow, unsymmetrically pyriform, and marked by lines of growth.

There are two varieties of this animal; the one usually regarded as the typical, *E. polita*, has bright golden yellow tentacles; the spaces around the eyes are colourless; the crown of the head is tinged with yellow; the bilobed mentum is bordered with a conspicuous line of golden yellow; the rest of the animal is white. The other (*nitida* of British collectors) has the entire animal white, except a pink space surrounding the eyes. We have figured both varieties, but confess ourselves unable to distinguish between their shells.

This beautiful shell is sparingly distributed in from seven to fifty fathoms, on a sandy bottom, along the southern and western coasts of Britain, and all round Ireland. It is found also on the east coast of Scotland. It appears to be most abundant on the south coast of Ireland, but is also sufficiently common in some of its Scottish localities. In twenty-five fathoms off the Coquet (Thomas). Scarborough (Bean).

It ranges from Norway to the Mediterranean, and occurs fossil in both coralline and red crags.

E. DISTORTA, Deshayes.

Small, pure white, usually distorted and compressed, otherwise very slender; spire more or less curved; edge of outer lip greatly arched.

Plate XCII. fig. 4, 5, 6, and (Animal) Plate K K. fig. 4.

Helix polita, fry, MONT. Test. Brit. p. 398?
Melania distorta, PHILIPPI, Moll. Sicil. vol. i. p. 158, pl. 9, f. 10.

Eulima distorta, Desh. Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 454.—Thompson, Ann. Nat. Hist. vol. xiii. p. 432.—Jeff. Ann. N. H. vol. xix. p. 311 (no descrip.).—Alder, Moll. Northumb. and Durh. p. 46. animal. — Philippi, Moll. Sicil. vol. ii. p. 135.
„ *polita*, Macgilliv. Moll. Aberd. p. 142?

It is probable that what Montagu, Turton, and other British writers have regarded as the fry of *polita* were adult specimens of this small and strange-looking species. There appear to be two principal varieties; one abbreviated, longitudinally compressed, and greatly arcuated; the other scarcely compressed or curved, and much more slender. Both of them are pure white shells (with bright scarlet specks when the animal is in them), and exhibit the general characters of *polita*. The former approaches it closely in shape, but may be distinguished by its compression, curvature, and small dimensions; its mouth too is slightly more produced, and its inner lip is almost devoid of angularity.

The Clyde variety (?), *gracilis*, is much more elongated and bears a strong resemblance in general figure to *subulata*, from which its smaller size, its quicker basal declination, its shorter penult turn, and less produced body, the basal pouting of its outer lip, and the almost invariably greater or lesser curvature of its spire suffice to distinguish it. The typical characters of *distorta* are, however, less intensely present, the compression being scarcely perceptible, and the distortion by no means striking. These straighter individuals differ from *polita* by their minuteness, their much more slender proportions, &c. A third of an inch is as much as specimens usually attain to in length; in the bent typical form the breadth is not much more than a third of this; the width in the slender and straighter examples is often not even a single line.

The animal which we have examined alive at Roundstone Bay, on the west coast of Ireland, has rather longer subulate tentacula than its British congeners have; the tips of these organs are white, and the bases and about a third of their lower parts of a brilliant vermilion colour; the eyes are large and placed within white spaces at the bases of the tentacula. The sides of the neck are clouded with vermilion. The foot, as usual long and produced in front, and rest of the animal are white. The lateral flaps are not greatly developed. The mentum is not marked by any coloured line. Philippi's figure and description of the animal in Mediterranean specimens accords with our observations. An example taken on the Northumberland coast, and described by Mr. Alder, had a yellow body, beautifully variegated with carmine, which formed an irregular band on each side. The tentacles and foot were white. Mr. Alder observes that the liver, as seen through the shell, is green in *distorta*, and purplish in *polita*.

This species is probably sometimes confounded with the young of other forms. It has a wide range in Britain, Guernsey, and Sark (Barlee); Exmouth (Clark); Whitesand Bay (Jeffreys); off the Isle of Man in thirty fathoms (E. F.); Loch Fyne (Jeffreys); in eighty-two and ninety fathoms, Zetland, and in twelve fathoms, Orkney, always in sand (M'Andrew and E. F.) At Whitburn, on the Northumberland Coast, taken by the Rev. G. C. Abbes (Alder). "On the east, west, and south coasts of Ireland" (W. Thompson); Arran in Galway (Barlee); Bantry Bay and Cork harbour (Jeffreys).

It ranges from Norway to the Mediterranean.

E. SUBULATA, Donovan.

Narrowly subulate, usually pale fulvous, with an upper and lower reddish yellow spiral band on each of the upper whorls, and from three to six zones on the body: very rarely uniform snow-white: mouth very narrow, occupying one-third the total length.

Plate XCII. fig. 7, 8.

Strombiformis glaber, DA COSTA, Brit. Conch. p. 117 (probably).
Turbo trifasciatus, ADAMS, Trans. Linn. Soc. vol. v. pl. 1, f. 13, 14 (probably).
,, *subulatus*, DONOV. Brit. Shells, vol. v. pl. 172. — TURT. Conch. Diction. p. 218. — DILLW. Recent Shells, vol. ii. p. 881 (partly). — WOOD. Index Testac. pl. 32, f. 160.
Helix subulata, MONT. Test. Brit. Suppl. p. 143 (not p. 142). — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 210. — RACK. Dorset Catal. p. 55, pl. 19, f. 14.
,, *flavocincta*, MEG. MÜHLF. Verhand. Berlin. Gesel. Nat. vol. i. pt. 4, p. 216, pl. 8 (= 2), f. 6.
Melania Cambessedesii, PAYRAUD. Moll. Corse, p. 107, pl. 5, f. 11, 12.—PHILIPPI, Moll. Sicil. vol. i. p. 157.
Eulima subulata, RISSO, H. N. Europe Mérid. vol. iv. p. 124, f. 39 (probably).— DESH. Lam. Anim. s. Vert. vol. viii. p. 455. — PHILIPPI, Moll. Sicil. vol. ii. p. 134.
Melania Donovani, FORBES, Malac. Monens. p. 15.
Eulima lineata, SOWERBY, Zool. Proc. 1834, p. 8; Conch. Illust. Eulima, f. 13.

Da Costa's name would undoubtedly have priority, could we only positively decide which of the smaller British *Eulimæ* he actually intended; the evidence is in favour of the present species, but we do not hold it advisable to alter, where any uncertainty prevails, the specific appellation by which a shell is generally known.

This and *polita* are the two most opposite and distinct forms of the British *Eulimæ*. The shell we are about to describe has a very slender subulate form, with a very narrow base, the average length being to the breadth as four to one at least. It is rarely at all arcuated, is more or less thin and semitransparent, quite smooth, and of a highly polished, pale fulvous tint, with three spiral zones of orange-brown encircling the body, and two similar ones winding round each of the lower turns of the spire. Occasionally the body-whorl seems adorned with six revolving lines, from the outlines of the zones, the first of which lies a little below the suture, the second in the middle, and the third, which is broader than the rest, at the base of the shell, being alone visible. The spire for the most part consists of about nine or ten whorls, that are divided from each other by a decidedly oblique suture, which is perceptible enough on the superior volutions. The longitudinal increase of these turns, which are decidedly high—the penult not being much broader than it is long—is moderately fast for the genus. The upper half of the shell tapers rather quickly to a fine point; the two whorls that form the lower half are subcylindrical; the body is half as long again as the penult, its basal declination is convex and almost imperceptibly gradual. The mouth, which fills one-third of the total length, is very narrow, has an oblong acuminated shape, and contracts from its well rounded basal extremity to a very acute posterior angle. The outer lip is simple and acute; its edge is nearly straight or very gently arched, and neither sinuous above nor pouting at the base. The solid white and slanting pillar occupies more than half the length of the mouth, and does not form an angle with the base of the penult turn, but unites itself to it in a gently concave line. The inner lip is prominently, though not broadly, reflected at the base of the shell. Our largest example measured a line and a half across, and seven lines in length.

Two fine specimens of a bandless snow-white shell, which may possibly prove a distinct species, but to which our description of *subulata* will otherwise apply (the whorls are a little more convex), were dredged by Mr.

M'Andrew, from a sandy bottom of eighty-two fathoms, thirty miles from the east coast of Zetland.

We have examined the animal alive in Mediterranean specimens. It has the usual elongated foot and subulate tentacles of its congeners, but has the lateral lobes much more largely developed, and somewhat obliquely placed. The operculum is unsymmetrically pyriform, corneous, thin, and has a slight involution, as if an effort towards the formation of a spire at its rounded extremity.

This shell is distributed sparingly along the southern and western shores of Great Britain, and around Ireland, extending from Cornwall and Cork to Zetland, and inhabiting in depth from ten to eighty fathoms. Mr. Bean states that it occurs, though rarely, at Scarborough.

It extends its range to the Mediterranean, and dates backwards in time to the coralline crag epoch.

E. BILINEATA, Alder.

Narrowly subulate, whitish, with two adjacent reddish yellow lines encircling the lower half of the upper whorls, and the middle of the final one.

Plate XCII. fig. 9, and (Animal) Plate K K. fig. 5.

Helix subulata, MONT. Test. Brit. Suppl. p. 142 (small variety).
Phasianella subulata, FLEMING, Brit. Anim. p. 301.
Rissoa „ JOHNSTON, Berwick Club, vol. i. p. 272.
Eulima „ MACGILL. Moll. Aberd. p. 142. — Brit. Marine Conch. p. 188.
Pyramis „ BROWN, Illust. Conch. G. B. p. 14, pl. 9, f. 64, 65.
Eulima lineata and *bilineata*, ALDER, Moll. Northumb. and Durh. p. 47.

It is with some hesitation that we adopt this shell as a species, and rather in accordance with our principle of never degrading a species from the rank it has once been elevated to, without palpable proof of its being a mere variety, than from any conviction of colour alone constituting (although in some genera, where the possible diversities of form and sculpture are limited, it perchance may) a sufficient ground for specific distinction.

We have never, however, seen any intermediate examples by which we could connect the painting of this shell with that of *subulata*, to which in other respects it most closely approximates. The distinctions are thus indicated by Mr. Alder. "Two species appear to be included under the name of *E. subulata.* The smaller and much more common species, has only two bands placed close together in the centre of the body-whorl, with occasionally a faint indication of another on the upper or lower margin. The shell is thinner and more transparent than in the larger species, the whorls less oblique, the lower one a little more ventricose, the aperture not so much contracted, and the columellar margin not quite so straight." To this we may add that in our own examples the bands are adjacent and linear, and run along the lower half of each of the upper turns, and round the middle of the body-whorl; the ground tint is white, and the base of the pillar, as well as the revolving lines, are of a reddish yellow. We counted nine whorls only in our largest specimen, which only measured the third of an inch. Whether these last characters are permanent is more than we dare affirm, since we have not seen very many individuals. As we refer the *lineata* of Sowerby to the preceding shell, we have used the epithet suggested as more appropriate by Mr. Alder.

"The animal is white, with two long subulated tentacles, approximating at the base, with the eyes immediately behind them. The foot extends a good deal before the head, and has a bilobed flap on the upper surface in front, which appears to be common to the genus, as we have observed it in all the British species. The head is seldom protruded beyond the shell, which being transparent, the animal can easily see through." ALDER.

In shell sand, rather rare on the Northumberland coast. One specimen alive from the boats at Cullercoats (Alder). Also dredged in the same province at Whitburn, by Mr. Howse. Scarborough (Bean). Berwickshire (Dr. Johnston). Exmouth (Clark). Herm, near Guernsey (S. H.). Cork Harbour; Bantry Bay; Loch Fyne (Jeffreys); Zetland (Barlee); several of the localities enumerated for *subulata*, to which it is very nearly allied, may probably belong to this form.

CHEMNITZIA, ALCIDE D'ORBIGNY.

Shell elongated, of many whorls, ribbed in the direction of its length, often spirally striated, surface not polished. Apex of the spire with a persistent embryonic sinistral shell, forming the summit. Aperture oblong or subquadrate, peristome incomplete, thin but solid, columella usually toothless, rarely with a plication, straight, or nearly so. Operculum corneous, pyriform, marked by lines of growth, and having the imperfect rudiments of a spiral nucleus at one extremity.

Animal with a broad head ending in a narrow bilobed snout furnished with a retractile proboscis; tentacula two, triangular or ear-shaped, their inner bases connate or nearly so; eyes placed at the inner sides of the tentacula. Tongue probably unarmed. Anterior and upper margin of the foot furnished with a distinct fold, or mentum. Foot triangularly lanceolate, short in proportion to the length of the shell. Operculigerous lobe apparently simple (but, according to Lovén, furnished with a minute conical process on each side).

In retaining the name *Chemnitzia* for a group of very beautiful and easily recognized little shells, it is necessary that we should defend both the adoption of the assemblage as a genus at all, and, when we have done so, why we give it the name proposed by M. Alcide d'Orbigny, in preference to other appellations. Moreover, in using this generic term, we are doing so in a somewhat peculiar sense, bringing together in it not only *Chemnitziæ*, strictly so called, but also certain species which have been constantly regarded as *Odostomiæ*, in the restricted meaning of the last named genus. On the other hand, we refer to *Odostomia*, a few forms which are more usually regarded as *Chemnitziæ*.

Although the history and literature of true mollusks have been fully and ably discussed by our friend, Mr. Gwyn Jeffreys, in his excellent Memoir "On the recent species of *Odostomia*," communicated to the British Association at Swansea, and afterwards published in the "Annals of Natural History," it is nevertheless necessary to say a word or two respecting the principal appellations applied to them. Three authors have regarded the ribbed shells here described under *Chemnitzia* as forming a natural genus. Risso termed them *Turbonilla*, adopting a manuscript name given to them by Leach; Lowe defined and determined admirably both animal and shell under the name *Parthenia*, and Alcide d'Orbigny constituted and defined for them a group under the name of *Chemnitzia*. The last name which stands second in point of date, but which might be objected to, since, in the work in which it appears (the "Natural History of the Canaries," by Webb and Bartholet), it is given to a subgenus of *Melania*, has been most generally used of late as most convenient. To this we assent, and deem it a sufficient reason, for, assuredly, the name *Turbonilla* comes much too near the names of other mollusks with which the shells before us have no affinity.

But in adopting this restricted genus at all, we are acting reluctantly in opposition to the views of several eminent authorities who have devoted much and special attention to the group and its allies.

Professor Lovén, in an excellent paper published in the proceedings of the Royal Swedish Academy for 1846, combines the mollusks composing the group *Chemnitzia* and *Odostomia*, under the name *Turbonilla* of Leach, and gives a full and strict definition of both animal and shell. Mr. Jeffreys, in his paper cited before, takes the same view, but extends to the whole assemblage the name *Odostomia* given by Dr. Fleming to the toothed species. Mr. Alder and, we may add, Mr. Clark are inclined likewise to regard the *Odostomiæ*, *Chemnitziæ*, and *Eulimellæ* as one. The last mentioned name was given by Professor E. Forbes to certain smooth and polished forms previously referred to *Chemnitzia*.

There is no question that the animals of all these shells are very similar to each other. Moreover there can hardly be a question about the small value which should be attached to the presence or absence among them of a fold on the columella. But the polished and, as it were, enamelled surface of the shell in the majority of so-called *Odostomiæ*, and in all the *Eulimellæ*, is a character assuredly of consequence as a point of structure, and conspicuously accompanies other features. In the family of *Pyramidellæ*, the structure of the shell is assuredly of generic importance in other instances, and we hold it to be so in this. Our proposed arrangement, then, is to retain the name *Chemnitzia* for the ribbed shells without tooth; *Odostomia* for such as are smooth or rarely plicated, and if solid or enamelled, always toothed; and *Eulimella* for those with a smooth enamelled surface, and no tooth on the straight columella. The apex in *Chemnitzia* seems, almost always, to consist of more coils than one.

Although existing *Chemnitziæ* are all small shells, there are fossil species belonging to this genus of considerable dimensions. During the palæozoic epoch, shells very nearly connected with this group lived, and during the oolitic epoch characteristic forms of it were not uncommon. Those now in being are often of extreme elegance of form and richness of sculpture. For the most part they inhabit the laminarian zone in gravelly or stony places, but some of them range to considerable depths, even to one hundred fathoms and below. The genus appears in the main to belong to temperate climates.

C. ELEGANTISSIMA, Montagu.

Slenderly-turreted, uniform white, with from nine to thirteen flattened, or but little convex, whorls; ribs strong, simple, oblique, close, numerous (at least fifteen); no spiral sculpture.

Plate XCIII. fig. 1, 2.

Turbo lacteus, LINN. Syst. Nat. ed. 12, p. 1238.?
„ *elegantissimus*, MONT. Test. Brit. vol. ii. p. 298, pl. 10, f. 2; Suppl. p. 124.—TURT. Conch. Diction. p. 209.—DILLW. Recent Shells, vol. ii. p. 856.—WOOD, Index Testac. pl. 31, f. 97.
„ *acutus*, DONOV. Brit. Shells, vol. v. pl. 179, f. 1.
Helix elegantissima, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 209.
Turritella „ FLEMING, Brit. Anim. p. 303.—POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 281.
Melania Campanellæ, PHILIPPI, Moll. Sicil. vol. i. p. 156, pl. 9, f. 5.
„ *elegantissima*, FORBES, Malac. Mon. p. 15.
Parthenia „ LOWE, Proc. Zool. Soc. 1840, p. 41.

Chemnitzia elegantissima, Philippi, Moll. Sicil. vol. ii. p. 136.
„ *gracilis*, Philippi, Moll. Sicil. vol. ii. p. 137, pl. 24, f. 11.
„ *pusilla*, Philippi, Moll. Sicil. vol. ii. p. 224, pl. 28, f. 21.
Eulima elegantissima, Macgilliv. Moll. Aberd. p. 141.
Pyramis „ Brown, Illust. Conch. G. B. p. 14, pl. 9, f. 61.
Odostomia lactea, Jeffreys, Ann. Nat. Hist. new ser. vol. ii. p. 348.

From the uncertainty which must ever exist as to whether the *Turbo lacteus* of Linnæus was identical or not with this graceful shell, we have preferred the appellation under which the species was first clearly characterized and published. It is possible that Dr. Philippi, who has evidently subdivided this species in his "Enumeratio Molluscorum Siciliæ," may have been correct in so doing; but although we have shells on our own coasts that decidedly accord with his descriptions and figures of *pusilla* and *gracilis*, we are not prepared to regard them as more than varieties, until an enlarged knowledge of their several inhabitants confirms their claims to specific distinction. We will proceed, then, to describe the larger or more typical form, and then point out the more strikingly aberrant forms.

The shell, which is thin, semi-transparent, and of an uniform glossy white, has a slender and produced-turreted shape, that is not cylindraceous, but tapers with moderate quickness to a fine but irregularly twisted apex. There are from eleven to thirteen slowly enlarging simple (not scalariform) volutions, which are decidedly narrow (occasionally so greatly so that the width is twice the height), plano-convex, and divided by a not particularly oblique fine, yet strongly impressed, suture. They are longitudinally traversed by very numerous (from sixteen to twenty in general) and densely arranged oblique ribs, that are more or less prominent and strong, sometimes a little flexuous, but not arched, and never crenated nor marked with any sculpture whatsoever; the interstices are likewise quite smooth, and almost always, if not constantly, narrower than the ribs. The base, whose surface is on a level with the costæ, is smooth, or only marked by lines of growth, and is moderately rounded. The aperture, which is subrhombic-oval, occupies from one-fifth to one-sixth of the entire length of the shell, and rather more than one-half the basal diameter. The outer lip scarcely recedes in front, and is a little incurved posteriorly. The pillar is straight, vertical, narrow, rather long, and forms a distinct angle with the upper portion of the inner lip. Our largest specimens measure three-eighths of an inch long, and a full line at the broadest part.*

Both *gracilis* and *pusilla* are much smaller, and have a lesser number of volutions (nine), which are rather higher in proportion, than in the type. In the former variety the shape is more aciculate; in the latter the form is more cylindrical below, and more abruptly tapering above.

The animal is white.

This is by far the commonest of the *Chemnitziæ*, being met with almost all round the coasts of the United Kingdom, though most abundantly on the Southern and Western shores. It is dredged also in shallower water than most of the other species; hence it is more frequently picked up dead on the sands. Its foreign distribution is very extensive.

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* The obscure *Turbo subarcuatus* of Adams (Trans. Linn. Soc. vol. iii. p. 66, pl. 13, f. 27, 28.—MONT. Test. Brit. p. 333.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 185.—TURT. Conch. Diction. p. 230.—*Pyramis s.* BROWN, Ill. Conch. G. B. p. 14, pl. 9, f. 62) is supposed, and with much probability, by Mr. Jeffreys to be merely a curved form of this species. The equally obscure *Turbo carinatulus* of British compilers, constituted merely from a wretched drawing in Walker's "Testacea Minuta," may possibly be a broken-mouthed example of this shell likewise: it is certainly meant for a *Chemnitzia*, but the species must be conjectural.

C. rufa, Philippi.

Either reddish, or with a single revolving band of tawny orange on a white ground; ribs not oblique, their intervals moderately broad, and spirally grooved.

Plate XCIII. fig. 3, 4. Animal, pl. FF. fig. 4.

? *Turbo simillimus*,* Mont. Test. Brit. Suppl. p. 135, and Laskey, Mem. Werner. Soc. vol. i. pl. 8, f. 15, from which, Turt. Conch. Diction. p. 209 ; Dillw. Recent Shells, vol. ii. p. 856 ; Wood, Index Testac. pl. 31, f. 98 ; *Turritella simillima*, Fleming, Brit. Animals, p. 303 ; Brit. Marine Conch. p. 190 ; *Pyramis simillimus*, Brown, Ill. Conch. G. B. p. 15, pl. 9, f. 48.

Melania rufa, Philippi, Moll. Sicil. vol. i. p. 156, pl. 9, f. 7.

Turritella fulvocincta, Thompson, Ann. Nat. Hist. vol. v. p. 98.—Brit. Marine Conch. p. 191, f. 19.

Parthenia crenata, Lowe, Proc. Zoolog. Soc. 1840, p. 41 (undescribed).

Chemnitzia rufa, Philippi, Moll. Sicil. vol. ii. p. 136.

Pyramis crenatus, Brown, Ill. Conch. G. B. p. 14, pl. 9, f. 53.

Turbonilla „ Lovén, Index Moll. Scandinav. p. 18 (probably).

Chemnitzia fulvocincta, Alder, Cat. Moll. Northumb. and Durham, p. 48.

Odostomia rufa, Jeffreys, Ann. and Mag. N. H. ser. 2, vol. ii. (1848) p. 346.

We have, with some slight hesitation, followed the opinion of Lovén, Jeffreys, and Alder, in regarding this shell as identical with the *rufa* of Philippi, although it differs in some minor particulars. The Mediterranean type presented to us (unfortunately the last whorl was broken away) by the author of the species is rather more slender and solid, has the ribs, which are twenty-three in number, quite straight, the volutions quite flat, and the colour reddish, with the spiral band indistinct, yet visible in certain lights.

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* At least, it agrees better with this than with any other of our known *Chemnitziæ* (and assuredly it belongs to that genus). Montagu, in addition to his brief description, remarks, that it resembles *elegantissima*, but is less slender, and has fewer and more distant riblets, that are not slanting, but arched, and with broader intervals. Laskey is said to have taken the shell from the shore of Jura.

"Slender, white, with eight or nine volutions, furnished with fourteen ribs or elevated striæ ; these stand straight in the line of the shell ; apex pointed ; base destitute of striæ; aperture subovate. Length three-eighths of an inch." (Mont.)

This species is of a slender produced-turreted form, rather thin, a little translucent, of a glossy yellowish-white or flesh-colour, and encircled with a single narrow band of tawny orange, that winds between the inferior suture and the middle of each whorl. The surface is longitudinally traversed by about from seventeen to twenty rather strong and prominent ribs, which are a little curved, yet not oblique, convex on their upper surface, not continuous, and nearly if not quite as broad as their intervals. The latter are marked with five or six spiral series of not very profound grooves. The whorls, which are about twelve in number, are plano-convex, broader below than above, simple (not scalariform), rather more than half as broad again as they are high, and of moderate longitudinal increase; they are separated from each other by a distinct but not excavated, scarcely oblique suture, and terminate in a rather fine point. The base of the shell is only furnished with not very closely disposed spiral striæ; it is not angulated at the circumference, but rounded, yet so far compressed, that the front of the aperture juts out considerably; its axis is imperforate. The mouth, which occupies from one-fifth to one-sixth of the entire length of the shell, and about one-half the basal diameter, is much longer than broad, and somewhat rhomboidal, but is rounded anteriorly, since the front of the outer lip, which is acute, simple, and previously nearly straight, is arcuated at its junction with the pillar lip. This last is very narrow, rather long, somewhat reflected, and either straight, or leaning a little away from the outer lip. The majority of examples do not exceed the third of an inch in length, and three quarters of a line in breadth.

What we temporarily regard as the southern form is a rather stronger and larger shell (one we dredged at Weymouth measures half an inch in length, and the tenth of an inch in breadth), is of an uniform pale rufous tint, and has from twelve to fourteen still flatter whorls, and quite straight ribs, which vary in number and thickness upon different specimens. The form too is very variable, being slender in some individuals, whilst in others it is shorter, and tapers more suddenly from a broader basal volution. The intervals between the spiral lines upon the base are occasionally elevated into obtuse costellæ.

The animal is entirely white. Its tentacles are obtusely lanceolate, rather broad, set well apart, and having their eyes at their bases a little on the inner side. The foot is oblong, truncated, with slightly obtuse angles in the front, obtusely and rapidly triquetrous behind. The mentum is bilobed, narrower than the foot, and angulated, but not acutely. In crawling the animal advances both mentum and foot much in front of the head, and the former often foremost.

This beautiful shell, although but recently defined as a native species, having first been distinctly recorded by Mr. W. Thompson, is very generally distributed around our coasts, occurring on all sides of the British Islands, usually, however, sparingly. It inhabits a bottom of sand or sandy mud, usually in from fifteen to thirty or forty fathoms water, but Mr. M‘Andrew has dredged it in as deep as ninety fathoms off the Zetland Isles, and Mr. Jeffreys in as little as eight fathoms at Fishguard. The original specimens found by Miss Mary Ball at Portmarnock, were taken, we believe, from shell sand.

It ranges from the coasts of Scandinavia, where it has been taken by Lovén, to the Mediterranean sea.

C. FORMOSA, Jeffreys.

Moderately large, white, slenderly turreted; lower whorls flattened; intervals of the straightish ribs encircled with about five spiral costellæ on each turn, and excavated above the profound suture; mouth not a sixth of the entire length.

Plate XCIII. fig. 5.

Odostomia formosa, JEFFREYS, Ann. and Mag. N. H. ser. 2 (1848), vol. ii. p. 347

This extremely rare shell is so slenderly turreted as almost to be aciculate; it is comparatively strong for the genus, only very slightly glossed, opaque in the very few examples we have seen (perhaps dead specimens), and of a pure and uniform white. The sculpture of the volutions, which terminate in a fine point, consists of about twenty prominent nearly straight longitudinal ribs, that are tolerably strong, of about the same breadth as their intervals, not continuous from whorl to whorl, but suddenly dwindling off below to a bluntish point, and about five interstitial series of scarcely elevated spiral costellæ, each of which, when examined by a powerful lens, is found to be composed of from three to five raised lines. The whorls, the majority of which are nearly flat, and subturriculated, although some of the superior ones are more rounded, are of very gradual increase, and are divided by a distinct and but slightly oblique suture, that appears remarkably broad, owing to its limits being enlarged by the inferior attenuation of the costæ, and by an excavation of their intervals, which produces a sudden contraction at the base of each volution, and is continued in a revolving line along the bottom of the body-whorl. The spiral interstitial lines seem to be rather indistinctly continued upon the base of the shell, which is moderately rounded, and neither abruptly compressed, nor angulated at the circumference. The aperture, which occupies about one-seventh of the entire shell, is very much longer than broad, subrhomboidal, but well rounded anteriorly, and not sculptured internally. The outer-lip is simple and acute; the pillar is rather long, nearly straight (not oblique) and very slightly twisted posteriorly. The breadth of the largest individual we have seen, which measured four lines in length, was only the sixteenth of an inch.

This species was discovered by Mr. Jeffreys at Oxwich Bay, near Swansea, and has been taken at Shellness in Kent, by Mr. G. B. Sowerby, and Bantry Bay by Mr. M'Andrew.

C. FENESTRATA, Forbes and Jeffreys.*

White; whorls subangulated, encircled below with two revolving keels, longitudinally ribbed above.

Plate XCIII. fig. 6, 7.

Odostomia fenestrata, JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 345.

This species, observes Mr. Jeffreys, who was the first to describe this exquisitely sculptured shell, " was first noticed and named by Professor Edward Forbes at the meeting of the British Association in 1846, but no account of it appears in their Reports." It is of a slender turreted form, moderately thin, slightly translucent and glossy, and of an uniform white. There are usually eight whorls, which are not simply convex, but swell out subangulately rather below the middle, for the upper portion is flattish or retuse, and gently shelves outwards, whilst the lower portion is either perpendicular or has an inclination inwards. They are of rather slow longitudinal increase, at least half again as wide as long, taper to a moderately fine point, and are divided by a well defined and not much slanting suture. Two closely disposed costellar lines, which become tuberculated on meeting the numerous (yet not crowded) oblique and prominent longitudinal riblets, that traverse the superior portion of each of the principal turns, encircle the lower area of the volutions which compose the spire; one or two additional spiral carinæ are present on the body, where a prolongation of the longitudinal costellæ produces a distinct clathration; beneath them the base, which is short and but little convex, is smooth or almost so. The intervals between each kind of sculpture are broader than the sculpture itself, except the space between the lower suture and the anterior carina, which, if anything, is narrower.

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* Brown's figure of his *Pyramis spirolinus* (Illust. Conch. G. B. p. 15, pl. 9, f. 66) displays much of the peculiar aspect of the *C. fenestrata*, but his description does not confirm the identification:—

" White, abruptly tapering, with seven deeply divided, somewhat triangular, volutions, with a subcarina near the lower margin of each, from whence they suddenly oblique towards the suture; provided with about fourteen rather strong, longitudinal ribs, and these are crossed by numerous, rather wide, spiral striæ, giving the shell a cancellated appearance, aperture suboval, slightly contracted above; outer-lip thin; pillar lip reflected on the columella. Length somewhat more than an eighth of an inch; breadth about half its length." The type was picked up by the author from the beach at St. Cyrus, Kincardineshire.

The mouth, which is of a rhomboid oval shape, occupies about a fifth of the entire length, and more than one-half of the basal diameter: the throat merely exhibits the indentations of the external sculpture. The outer lip is acute, straightish above, and abruptly arcuated below, so as to meet the pillar lip, which is straightish, peculiarly thin and narrow, and rather erect than appressly reflected, at nearly a right angle. Specimens are usually a fifth of an inch long, with a breadth of about one-fourth at most of that measurement.

This very scarce shell, the animal of which has not as yet been observed, was first dredged, though dead, in seven fathoms at the entrance of Dartmouth Harbour (M'Andrew and E. F.). It has since been taken alive in Torbay near Brixham (S. H. and Dr. Battersby). It has been taken in Asturias by Mr. M'Andrew.

C. SCALARIS, Philippi.

Scalar, rather short, white, with two tawny revolving fillets; ribs very prominent, narrow, straight, their rather broad intervals adorned with several raised spiral lines, basal declination flattish; mouth subquadrate.

Plate XCIV. fig. 5.

Melania scalaris, PHILIPPI, Moll. Sicil. vol. i. p. 157, pl. 9, f. 9.
Chemnitzia „ PHILIPPI, Moll. Sicil. vol. ii. p. 137.
Odostomia „ JEFFREYS, Ann. Nat. Hist. new series, vol. ii. p. 346 (var. *a*.)

Among collectors this shell has generally been distinguished by the manuscript name *Jeffreysii*, a merited compliment to one, whose ardour in collecting the materials for the fitting study of the British Testacea is only equalled by the liberality with which he throws open his stores to all who, like himself, have devoted their earnest attention to the advancement of Conchology.

This elegant shell is turreted-scalariform, not particularly slender, and tapers rather quickly to a bluntish point. It is moderately strong, more or less glossy, and girt on a white ground, with spiral bands of fulvous, of which hue there are two bands, one narrow and subsutural, the other broader and inframedial, on each of the principal whorls of the spire, with a third additional one on the body that revolves from the posterior end of the suture to the anterior base of the aperture. The worn individuals, with which the majority of cabinets are alone furnished, exhibit, for the most part, a vitreous surface of uniform white. The spire, which is composed of seven or eight volutions (the broken apices of our adult examples forbid our positively specifying the exact number), seems to be between three and four times as long as the body. The whorls, which are rather high, and of moderately fast longitudinal increase, are more or less flattened, and angulately jut out above, beneath the narrow, yet distinct, and little slanting suture. Numerous, yet not crowded longitudinal ribs (we counted twenty on the penult turn of one of our specimens) that are straight, narrow, and acutely prominent, traverse the entire shell (a few of the earlier coils excepted) and oftentimes indent the sutural line by projecting beyond it. Their broad intervals are encircled with several raised lines, that become stronger and more densely disposed upon the somewhat flattened surface of the abrupt basal declination of the body whorl. The mouth, which does not occupy a fourth of the entire length, is subquadrate, and not so very much longer than broad; it is neither acutely contracted above, nor much rounded below. The acute and simple outer lip is not dilated; it is straightish at first, and then curving abruptly, yet with little convexity, unites itself to the bottom of the straight pillar lip, which latter is very narrowly, if at all, reflected, and forms a very wide angle with the straightish, and but little slanting base of the preceding volution. There is no distinct axial perforation, but occasionally a slight crevice behind the pillar. Our largest example measured three lines and a half in length, and a line and a quarter across at the base.

The animal is of a brownish madder hue, and in that respect strikingly differs from its British congeners.

We have taken it alive in ten fathoms water, Milford Haven (M'Andrews and E. F), and dead in seven fathoms at Dartmouth. It was first noticed at Exmouth by Mr. Clark. Mr. Jeffreys has found it at Fishguard, and Mr. Hanley in Guernsey. It ranges to the Mediterranean.

C. RUFESCENS, Forbes.

Moderately large, subulate, thin, not scalar, either pale reddish, with darker spiral bands, or the zones paler on a rufous ground; whorls convex; ribs crowded, often arched; their intervals with at least six raised revolving lines; basal declination rounded; outer lip moderately arched.

Plate XCIV. fig. 1.

Turritella indistincta, FLEMING (not *Turbo indistinctus* of Mont.), Brit. Anim. p. 304; copied Brit. Marine Conch. p. 191.

Chemnitzia rufescens, FORBES, Brit. Associat. Report, 1845.—Jeffreys, Ann. Nat. Hist. vol. xix. (1847) p. 311 (no descr.).

Turbonilla interrupta, LOVÉN, Index Moll. Scandinav. p. 18?

Odostomia scalaris, JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 311 (not variety).

The shell is turreted, subulate, thin, semitransparent, but little glossy, and either encircled, on a ground of squalid or reddish white, with two rufous or reddish tawny bands, one narrow and subsutural, the other broader and inframedial (sometimes occupying the entire lower half of the whorl), on each turn of the spire, with a broadish additional (and occasionally confluent) band of the same tint towards the lower end of the body, or more rarely of a rufous cast (becoming paler towards the tip), and adorned with a single narrow strip of white, that revolves rather above the middle of each volution, and a final bar of white on the extreme base of the shell. The surface is richly sculptured by thin and much projecting, often arched, longitudinal riblets, that interrupt, as it were, the course of the less elevated lines that wind around the volutions. The former series, which reach from suture to suture, but cease upon the slope or lower half of the body whorl, where the spiral lines, though finer and less prominent, are alone present, are very numerous on the principal coils (from twenty to thirty on the penult turn), and become more dense and approximate towards the outer lip. The latter, likewise, are equally distributed over the surface of each whorl, and are closely disposed and rather numerous, being at least seven in number, but often appearing more, some of them being double. The spire, which continuously tapers to a very fine point (the nucleus is exserted and much distorted), consists of eight or nine shortish whorls, that are profoundly divided by a moderately oblique suture; they are of gradual longitudinal increase, range in convexity from slightly to moderately rounded, incline a little inwards at their bases, and are not scalar, though oftentimes rather abruptly prominent above. In adult examples the basal declination of the body, which therein composes one-fourth to one-fifth of the entire length, is rounded but rather sudden. The mouth (whose matured peristome is complete) does not usually fill one-fourth of the total length, and has a narrow ovate figure, the symmetry of which is disturbed by the obtuse angle formed by the columella with the base of the preceding turn, and the abrupt angular contraction of its upper or posterior corner; it is well-rounded and not at all effuse below. Of the two lips, the outer one is simple, acute, and moderately arcuated; three-fifths of the inner one is occupied by the straight pillar-lip, which, although not appressed, is reflected and moderately broad. A line and a third is the average basal diameter of individuals that measure four lines in length.

The animal is white, slightly tinged with brown. The tentacula are rather long, lanceolate, set well apart, and bearing the eyes nearly centrally at their bases. The mentum is rather narrow and bilobed: the foot is oblong-lanceolate, obtusely angled in front, triangular behind.

This species appears to be the *Turritella indistincta* of Dr. Fleming, who found his shell at Loch Broom. It is a rare animal, occurring occasionally and sparingly in the Lochs of the Frith of Clyde, and in the Hebrides. We have taken it alive in twenty fathoms water off Mull, where it has been taken, as well as in Loch Fyne, by Mr. M'Andrew. Mr. Jeffreys has found it at Oban, and in the Rosshire Lochs and Mr. Barlee in several localities on the west coast of Scotland. It inhabits the coralline zone.

Lovén has taken it on the west coast of Sweden.

C. INDISTINCTA, Montagu?

Small, very slender, white; ribs depressed, flexuous, crowded; their intervals with numerous very fine revolving raised lines.

Plate XCIV. fig. 2, 3.

WALKER, Test. Minut. Sandvic. fig. 40?
Turbo indistinctus, MONT. Test. Brit. Suppl. p. 129 (probably).—TURT. Conch. Diction. p. 215 (copied).—DILLW. Recent Shells, vol. ii. p. 860 (copied).
Turritella truncata, FLEMING. Brit. Animals, p. 303 (teste Jeffreys from types).
Terebra speciosa, BEAN, Brit. Marine Conch. p. 267 (from type).
Pyramis indistinctus, BROWN, Illust. Conch. G. B. p. 14 (not figure), from Montagu.
Chemnitzia curvicostata, SEARLES WOOD, Crag. Moll. vol. i. p. 79, pl. 10, f. 1, fossil (probably).
„ *indistincta*, ALDER, Cat. Moll. Northumb. and Durh. p. 48.
Odostomia „ JEFFREYS, Ann. and Mag. N. H. ser. 2, vol. ii. (1848) p. 344.

The identity of this shell with the *T. indistinctus* of Montagu is rather traditional than positive, since the language of the "Testacea Britannica" does not precisely correspond with the characteristics of the present species. The *Terebra speciosa* of Bean was constituted from an individual which had received an injury to its aperture.

It is not easy to circumscribe the limits of this species, which has compelled us to examine and mutually compare a considerable number of specimens in order to determine the value of a character (the degree of volutional convexity), which elsewhere seems of specific, but here of mere varietal importance.

Living specimens of this curiously carved shell are rather thin, and of an uniform somewhat glossy and semi-transparent white. The shape is turreted-subcylindrical, and rather stunted; the apex is more or less obtuse. The whorls, which are seven or eight in number, enlarge but slowly, are fully half as large again as high, and are separated from each other by a well marked and not very oblique suture. They are crowded with very numerous and obliquely flexuous depressed costellæ that arch below to the left (if viewed dorsally), but slant a little in the opposite direction above, where they generally become confluent, and look as if hammered down; a peculiarity that sometimes causes the sutures to appear succeeded by a smooth rim. The interstices, which for the most part are narrower than the ribs themselves, are more or less distinctly traversed by a few elevated spiral lines, that generally (if not always) become faint or obsolete upon the superior portion of the volutions. The entire body-whorl is sometimes (in the more aged examples, entirely) destitute of the ordinary sculpture. The base of the shell, which is not angulated at the circumference, nor compressed below it, but rounded throughout, is never incised with spiral striæ only, but if not smooth exhibits almost to its anterior termination a decussation similar to, yet less decided than, that of the preceding whorls. The aperture ranges from oval to pyriform, and occupies from one-fourth to one-fifth (more frequently the latter) of the entire length of the shell; its breadth is fully one-half of the basal diameter. The pillar lip is rather long, simple, narrow, scarcely oblique or curved, erect posteriorly, and somewhat effuse in front, where a slight angularity is observable at its junction with the basal arcuation of the outer lip. The largest individual we have seen only measured two lines and a quarter in length, and about half a line in breadth.

The two principal varieties are distinguished by the flatness and comparative rotundity of their volutions. In the latter the essential sculpture is less defined, but the flexuosity of the ribs is more apparent, and sometimes there is a vestige of an umbilical chink; in the former the front portion of the base is almost always smooth, and the suture looks as if it were excavated, from the abrupt and slightly angulated inward shelve of the lower end of each whorl. The degree of convexity of the outer lip is regulated, of course, by that of the spire.

Mr. Jeffreys has communicated many localities for this variable species. It seems to range from the laminarian zone to as deep as forty fathoms or more. It occurs though rarely and locally all around the shores of the British Islands, and ranges to the Mediterranean. It has been found by Mr. Searles Wood in the coralline crag.

C. CLATHRATA, Jeffreys.

Pale reddish, subcylindraceous, not produced; whorls rounded; ribs broad, not crowded, their intervals girt at the base with distant revolving raised lines, of which there are two distinct ones on the smaller turns, and an additional one on the body: an umbilical chink.

Plate XCIV. fig. 4.

Odostomia clathrata, JEFF. Ann. and Mag. N. H. ser. 2, vol. ii. (1848) p. 345.

As only a single specimen of this newly discovered species has been taken, it is probable that the supposed essential characters may hereafter require revision: indeed, we cannot but suspect, that it may have to be united with the preceding, to some of whose varieties it approaches very closely. It is of an abbreviated-turreted form, a little cylindraceous, not very thin, somewhat glossy, and of an uniform pale reddish white. About twenty rather broad, somewhat curved and flattened ribs traverse the shell longitudinally; their profound interstices, which seem to widen at their bases, are spirally girt with raised, and almost linear, remote costellæ, of which only two are distinctly apparent upon the inferior portion of the volutions of the spire, and three upon the central portion of the body-whorl; vestiges of finer rudimentary ones are occasionally perceptible above them. There are seven rounded whorls, which terminate in a rather bluntish apex, and are separated by a distinct and slightly oblique suture, that is narrower in the last formed turns than in the earlier ones; they are rather produced, increase rather quickly than otherwise, are manifestly broader below than above, and are peculiarly well defined, owing to the rather sudden contraction of them at their lower suture. The base of the shell is well rounded, but rather short, and neither compressed anteriorly nor angulated at the circumference; it does not appear to be encircled with any spiral sculpture. The aperture, which occupies about a fourth of the entire length of the shell, and at least half the basal diameter, is almost simply ovate, yet a little contracted posteriorly; its peristome is nearly continuous; both its lips are acute, simple, and arcuated; the pillar lip, which is very thin, erect, and not reflected, except a little so in front, inclines rather away from the outer lip, and discloses a well-marked umbilical chink or perforation behind it. The length of the example rather exceeds the sixth, and its breadth the twentieth, of an inch.

It was discovered at Birterbuy Bay, on the west coast of Ireland, by Mr. Barlee.*

ODOSTOMIA. Fleming.

Shell turreted, subulate or ovate; surface smooth (more rarely spirally striated, or with longitudinal ribs). Apex of the spire sinistral. Aperture ovate, or subquadrate, columella lip rarely straight, usually with a tooth-like fold. Operculum ovate-acute, subspiral, corneous, transversely striated, placed on a simple lobe.

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* The *Pyramis lacteus* of Brown (Illust. Conch. G. B. p. 15, pl. 9, f. 58) probably belongs to this genus, and has been cited with doubt by Mr. Jeffreys as a variety of *elegantissima*. It was found by the author on Belton sands, near Dunbar; rather a suspicious locality for an indigenous species.

"White, subfusiform, consisting of ten abruptly tapering volutions, terminating in an acute apex, and well defined by the line of the suture; body ventricose, nearly equal to the length of the spire; the whole shell furnished with numerous depressed, not very distinct, longitudinal ribs; aperture subrotund; outer-lip thin, produced; pillar-lip very slightly reflected on the columella. Length an eighth of an inch; breadth not quite half its length."

Animal resembling that of *Chemnitzia* in all its principal features.

The mollusks which we have retained under this genus, are easily distinguished from the *Chemnitziæ* by the structure and aspect of their shells. Certainly they form a natural group, though whether we should consider it as more than a section may fairly be questioned. The species are difficult to distinguish and very critical; from their similarity it is not always easy to determine them at the time of capture; consequently our notes on their animals, drawn up entirely before the elaborate investigation of their shells by Mr. Jeffreys, are not available with certainty. This defect, however, we are enabled to remedy so far as some of the most important species are concerned, through the kindness of Mr. Clark, who has directed his attention to them especially during this summer of 1850, and has favoured us with several valuable descriptions, which we insert at their proper places.

As yet it is unsafe to speak positively with regard to the range in the European or other seas of the greater number of *Odostomiæ;* hence references to foreign distribution are seldom made under this genus. Several species, however, have been described as taken in the Red Sea, and we ourselves have many undescribed ones from Australia.

O. CONOIDEA, Brocchi.

Ivory-white, conical, smooth, solid: whorls more or less flattened; suture canaliculated; throat spirally lyrated.

Plate XCV. fig. 4.

Turbo conoideus, BROCCHI. Conch. vol. ii. p. 660, pl. 16, f. 2.
Auricula conoidea, FÉRUS. Tableau Syst. Moll. p. 101 (from last, name only).
Auricula ? conoidea, PHILIPPI, Moll. Sicil. vol. i. p. 143; vol. ii. p. 119.

Odostomia plicata, Hanl. Brit. Marine Conch. p. xxxv. f. 13.—Searles Wood, Crag. Moll. pt. i. p. 85, pl. 9, f. 3 (fossil).
Turbonilla „ Lovén, Index Moll. Scand. p. 19.
Odostomia Eulimoides, Jeffreys (not Hanley), Ann. Nat. Hist. vol. xx. (1847), p. 17.

The numerous and regular costellar lines, that spirally adorn the throat of this solid *Odostomia*, render the species, despite of the variation of its shape—which is sometimes broader sometimes narrower at the base—of easy recognition. It is of an uniform polished ivory-white, quite smooth, and of a produced conical shape. The spire, which rather quickly tapers to an acute point, is composed of six very gradually increasing, rather short, and almost flat volutions, the larger ones of which, for the most part, abruptly slope in at their bases, which often gives a somewhat distorted appearance to the shell. The suture is very profound or even canaliculated, and is moderately slanting. The body scarcely occupies two-fifths of the total length, and is abrupt, though rounded, at the basal declination. The mouth, whose projection is but trifling, is very decidedly shorter than the spire, has an oval-acute figure, being gradually contracted at the upper extremity, and is slightly disposed to effusion at the base or lower end, which is well but not broadly rounded. The outer lip is at first merely convex, and then gently arcuated. There is a very strong fold in the middle of the inner lip; above it the outline is convex; below it the pillar lip is arcuated and reflected, but not appressed. The umbilicus is wholly or partially concealed. Fine examples measure nearly a quarter of an inch in length, and a tenth of an inch in breadth. A variety exists, in which the whorls are more rounded, and only five in number. The Mediterranean examples are, for the most part, more regularly conical, and of rather faster volutional increase.

"Animal with a spiral shell of eight volutions, hyaline bluish white throughout, slightly shot with flake-white cloudy matter. Mantle plain. Head a cloven muzzle representing a second pair of short tentacula, mouth at the termination of the scissure; the true tentacula subtriangular, flat, bevelled, not very short, rounded at the tips, slightly setose; the eyes black, situated exactly at the internal bases of the tentacula, immersed in the skin, and so close to each other that a fine hair can scarcely be laid between them (I never saw the eyes so contiguous in any other animal). Foot large, rather long, membranous, reflected at the sides on itself—which reflection it in some measure retains on the march—largely concavely arcuated in front, causing the auricles to be pointed, and gradually tapering to a subtriangular posterior point. The suboval corneous operculum is carried, on a simple lobe, in a very advanced position, that is, nearly at the junction of the foot with the body.

"The animal is vivacious, displays the eyes on the march, and makes rapid progression. The head and cloven muzzle nearly resemble those organs in *Jeffreysia diaphana*."—Clark, MSS.

This species is dredged more abundantly at Oban, Skye, Loch Fyne, and other parts of the western coast of Scotland; but is likewise taken at Exmouth, Torquay, Weymouth, and Guernsey: also at Birterbuy Bay in Galway. It extends to the Mediterranean, and is found also in the north of Europe.

O. conspicua, Alder.

Not pure white; whorls more or less rounded; throat with raised spiral crenæ; fold very strong.

Plate XCV. fig. 6.

Odostomia unidentata, Hanley, Brit. Marine Conch. p. xxxv. f. 11.
„ *conspicua*, Alder, Trans. Tyneside Nat. Club, 1850.

Of this shell we have only seen a single good specimen; hence we cannot but entertain some doubts not alone as to what features must be regarded as of permanent specific value, but even as to its distinctness from the preceding shell.

The few individuals we have examined, are of a fulvous or livid flesh-colour, and in general aspect greatly resemble *acuta*, but are larger, stronger, and with rounder volutions. Of these, which are eight in number, the body or final turn is not so angulated at the periphery as in *acuta*, and its basal slope is less sudden; hence, too, the mouth, which is moderately large and nearly oval, is rather more produced at the base. The pillar lip is less-reflected and less strongly arched; the fold is rather above the middle of the inner lip; the umbilicus is not so distinct. The chief peculiarity, however, rests in the throat, which is furnished with a somewhat remote series of raised crenæ, which are not produced, as in *conoidea*, into spiral lyræ. Three lines and a half was the length of the largest specimen, which measured a line and a third across at the base.

Dredged in deep water off Whitburn; Douglas, Isle of Man (Alder); dead upon the shore at Herm, near Guernsey (Metcalfe).

O. UNIDENTATA, Montagu.

Solid, smooth, bluish white; body not equal to the spire in length, for the most part more or less angulated at the periphery; whorls a little convex, of quick longitudinal increase; apex blunt; mouth short, subrhomboidal; throat smooth; pillar lip perpendicular, reflected, with a prominent horizontal tooth-like fold: no umbilicus.

Plate XCV. fig. 7, 8.

Turbo unidentatus, MONT. Test. Brit. vol. ii. p. 324.—TURT. Conch. Diction. p. 222.

Voluta unidentata, MATON and RACK, Trans. Linn. Soc. vol. viii. p. 121.—DILLW. Recent Shells, vol. i. p. 508.

Odostomia plicata, FLEMING, Brit. Animals, p. 310.—Brit. Marine Conch. p. 172 (not of Syst. Index).

„ *unidentata*, Brit. Marine Conch. p. 172 (not of Syst. Index).—BROWN, Illust. Conch. G. B. p. 21.—JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 340.—ALDER, Cat. Moll. Northumberl. and Durh. p. 50.

Whether it be the nature of the shell to vary in shape more than its congeners, or that a greater familiarity with the species has increased our knowledge of the several aspects it is wont to assume, we know not, but the study of a large number of examples enables us to assert, that it ranges in shape from almost conical with a subangulated periphery (its more ordinary form in the cabinets of collectors) to turreted-conical with its periphery rounded. Its solidity appears a constant character; it is smooth, glossy, very little transparent, and of a bluish white. There are six shortish whorls, that are simply and moderately convex, of tolerably fast longitudinal increase, and very clearly divided by a strong but simple and not very oblique suture. The nucleus is peculiarly oblique and prominent, and appears to be composed of more than one coil. The apex is bluntish, and when it is filled by the animal has a blackish cast.

The body is usually to the spire as two to five (in the more produced form as one to three); its basal declination is more or less abrupt, somewhat flattened when the periphery is angulated, somewhat rounded when this is not the case. The mouth occupies from one-third to two-fifths of the entire length; the general character of it is to be short in proportion to its breadth; it is of a subrhomboidal ovate figure, especially in the more typical examples, wherein, besides that the pillar lip, which is always straight and never much elongated, meets the straightish base of the penult turn at an obtuse angle, and unites at almost a rectangle with the outer lip, this last, which is acute, simple, and more or less projecting below, being straightish above, forms likewise a rounded off angle with the basal line. The throat is perfectly smooth. The sharply projecting tooth-like fold is horizontally compressed, and lies almost in the middle of the inner lip. There is no umbilicus, but at most a chink. The columella is perpendicular, and the pillar lip curls over it (particularly in front) but is not quite appressed, the extreme edge being clearly defined. It is very seldom that individuals attain to the length (the fifth of an inch) ascribed to them by Montagu, who, we suspect, included *conoidea* with this species; the majority of our own examples are not above a line and two-thirds long, with a basal diameter of less than one half of this measurement.

The *O. unidentata* has the general aspect of *Rissoa ulvæ*, and approaches closely to the *O. conoidea* and *acuta*. The smaller size, the less planulate volutions, the more bluish tint of whiteness, and, above all, the smoothness of its throat, distinguish it from the former; the absence of both colour and umbilicus, its less acutely slender shape, and the greater straightness and reflection of its pillar lip, divide it from the latter: its volutional increase is more rapid than in either.

"Animal spiral, bluish hyaline white, inhabiting a white shell of seven or eight flattish volutions, mantle simple, and even with the shell. Head a subcylindrical muzzle occasionally extended beyond the foot, bearing short broad awl-shaped setose blunt tentacula, whose bases coalesce and form a membranous veil, between which and the foot the head issues; they have a fine transparent line through their centres; the eyes are within the internal bases, close together, sunken in the surface-skin of the connecting tentacular membrane. The foot is short, truncate, slightly auricled, but not in the least emarginate in front as in *O. acuta*, or even hollowed out as in *O. Eulimoides*, rounding gradually posteriorly, and sloping to a broad obtuse lance-shaped termination, and has on the posterior part of the upper lobe, which is simple, a light coloured corneous suboval striated operculum; the anterior under part of the foot is flake white, the posterior is hyaline, with a fine longitudinal line in the centre of that portion of it. This species would scarcely be distinguished from *O. acuta*, if it were not that the anterior part is not in the least emarginate, and the tentacula are rather stronger and broader than in that species. Branchial plume? The habitat is amongst the masses of Annelida, and other animals, congregated in old oyster shells, in the coralline zone. The animal is lively, and permits without difficulty a free examination of its organs." —Clark MSS.

Its range of depth appears to be considerable, it is taken occasionally from the rocks in Torbay and elsewhere (S. H.). We believe it to be an abundantly diffused species; at Tenby and Oban it is particularly plentiful

(S. H.); and has been met with on most of the investigated portions of the British coast.

Some six years ago, when few cabinets could boast of more than three or four species of *Odostomiæ*, and the data for determining the limits of species were consequently circumscribed, Mr. Hanley gave the name of *turrita* (Zool. Proc. 1844, p. 18. — Brit. Marine Conch. p. xxxvi. f. 10) to a remarkably elongated individual of this genus, which was taken in the islet of Herm, near Guernsey. The individual described from was worn, broken-mouthed, and a little distorted, but still exhibited a form very different from that of any known *Odostomia*. The shell we now figure (plate XCV., fig. 9) is precisely identical, except that the whorls are more regularly coiled; it approaches so closely to the produced and subcylindraceous variety of *unidentata*, that, until the examination of the animal shall manifest its true rank in the genus, we think it better to esteem it a provisional variety of the present species. The shape, however, tapers more acutely, the short body is well rounded below, and the whorls, of which there are five and a half (the nucleus is large) are rather higher, much more convex (especially anteriorly), and rather more oblique. The microscopic spiral striulæ that are often distinguishable in *unidentata* are in certain individuals of this form more perceptible than usual.

O. STRIOLATA, Alder.

Conic; whorls a little convex; spirally striolate; body subangulated; throat smooth; fold strong; no umbilicus.

Plate XCV. fig. 5.

Under this name Mr. Alder has forwarded to us a single individual, worn indeed and imperfect, but nevertheless presenting such perceptible marks of distinctness from all except *unidentata* (and its sculpture seems to forbid its annexation to that polymorphous shell), that we are unwilling to omit it, although almost equally averse to describing a new species from a single and not fully characterised example.

It is of a produced conical figure, strong, shining (perhaps from attrition), and of a snow-white hue; the principal whorls are very minutely, but distinctly, encircled throughout with closely disposed regular spiral striulæ, which becoming rather stronger upon the base of the body-whorl cause the intervening spaces to assume the appearance of fine and depressed costellæ. There are at most only five volutions, which rapidly taper to a blunt apex (not, however, a flattened one as in *insculpta*), are more or less high, of quick longitudinal increase, and not planulate, but a little convex: they become a little more rounded, perhaps, above the profound impressed sutural line. The body is subangulated at its periphery; its basal declination is rather gradual, and more or less flattened. There is no trace of an umbilicus. The mouth is oval-acute, and occupies two-fifths of the total length of the shell; no sculpture is apparent upon the throat, but the lip, which is straightish above, does not seem fully formed, hence the internal smoothness may not be constant. The pillar-lip seems more or less straight, and is appressed and not much reflected. The fold is strong, subcentral, and distinct. The length, which is rather more than double the breadth, is only the tenth of an inch. It came from Northumberland.

O. ACUTA, Jeffreys.

Conic, smooth, distinctly umbilicated; more or less thin, usually slender, and stained with vinous red, rarely snow-white and broader based; whorls flattish, of rather slow increase; apex acute. Periphery of the body almost always angulated. Mouth small, about half as long as the spire: pillar lip greatly arched, only narrowly reflected; tooth prominent: throat smooth.

Plate XCVII. fig. 8, 9.

Odostomia acuta, JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 338.

A typical specimen of this pretty species cannot well be confused with any of its British congeners. It is turreted-conic, smooth, shining, a little transparent, and more or less stained with vinous flesh-colour, especially upon the principal volutions. The spire, which acutely tapers to a more or less sharp point, is composed of six rather slowly increasing turns that are sometimes almost flattened, at other times a little rounded below and much tapering above, where they are at most but moderately, and more frequently are but slightly convex: their suture is but little oblique, and profoundly excavated. The periphery of the body-whorl, which is only about half as long as the spire (or at most occupies two-fifths of the entire length) is more or less angulated; the basal declination is abrupt, yet more or less rounded. The mouth is small, only occupying from one-third, at most, to one-fourth of the ventral length: it is of an ovate-acute figure, being peaked above, and either rounded or subangulated at the anterior extremity: the throat is quite smooth. The outer lip is simple, acute, arcuated, and not expanded. The pillar lip is thin, rather long, greatly arcuated, and but narrowly reflected: it is flanked by a linear indentation which terminates in a distinct umbilicus. The columellar fold is small, sharp, horizontal, and distinct: it lies almost in the middle of the inner lip. The usual length is only two lines, with a breadth of two-thirds of a line.

" The ground-colour of the animal is white; the mantle simple; the foot short, flake-white, in front deeply emarginate, so much so, as at times to present the appearance of a second pair of short tentacula, it rounds gradually to a blunt point, and carries a suboval elliptically striated corneous light horn-coloured operculum on a simple upper lobe. The head is a moderately elongated muzzle, marked with minute lead-coloured blotches. The tentacula are short, broad, awl-shaped, but not pointed, setose, eyes close together, immersed in the skin between their internal angles. The tentacula have an intensely white longitudinal line running from base to point in each. Branchial plume? This species is rare in the coralline zone. The animal is lively, not at all shy, and makes rapid progression."—CLARK MSS.

A rather larger variety is found, of a dull white, which has more rounded volutions, and its periphery devoid of all angularity. This last character seems to connect the species with the *umbilicata* of Alder (Trans. Tyneside Nat. Club, 1850), the periphery of which is well rounded or even ventricose. The only individual we have ever seen of it (kindly forwarded to us by the author) only differs from *acuta* proper in its snow-white hue, and more broadly conic shape; hence we provisionally regard it as a northern variety of this species. It came from Tynemouth; its axial perforation is very conspicuous.

It appears to be a somewhat local species, but is tolerably abundant at certain spots. It was dredged alive, in company with *Chemnitzia fenestrata,* in rather shallow water in Torbay, near Brixham (S.H.); has been procured at Exmouth by Mr. Clark; and from Loch Fyne and the west coast of Scotland, by Mr. Barlee, who has likewise dredged it in Galway.

O. PLICATA, Montagu.

Turreted-subconical, smooth, imperforated, rather strong; periphery not angulated; whorls rather high; mouth narrow, at most occupying one-third of the length: outer lip arched, smooth within: pillar lip arched, scarcely reflected; fold rather prominent, subcentral.

Plate XCVIII. fig. 1, 2.

Turbo plicatus, MONT. Test. Brit. vol. ii. p. 325; Suppl. pl. 21, f. 2. — TURT. Conch. Diction. p. 222 (chiefly).

Voluta plicata, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 131.—WOOD, Index Testac. pl. 19, f. 27.

„ *plicatula*, DILLW. Recent Shells, vol. i. p. 509.

Odostomia Annæ, MACGIL. Moll. Aberd. p. 157, from small worn shells, teste Jeffreys from types, copied in Brit. Marine Conch. p. 260, and BROWN, Ill. Conch. G. B. as *Jaminia Annæ*.

„ *plicata*, JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 339.

Jaminia plicata, BROWN, Ill. Conch. G. B. p. 21, pl. 8, f. 10.

Like most of its genus this shell is glossy white; it is moderately strong, quite smooth, and but slightly transparent. The form is turreted-subconical, being subcylindraceous below, and gradually tapering above to a moderately fine and rather projecting point. The spire is composed of five or six turns, that are tolerably high, merely convex, neither swollen nor inflected at their bases (as in some of the allied species), of slow longitudinal increase, and divided from each other by a tolerably distinct, but extremely fine, oblique suture. The body, which barely occupies two-fifths of the entire length, is not angulated at the periphery, but gently slopes at the base, which seems a little attenuated, with a convex declination. The shape of the mouth, which only fills a third or even a still less proportion of the ventral length, is oval-acute, being gradually contracted to a sharp angle above, and rather broadly rounded at the anterior extremity: the throat is devoid of sculpture. The outer lip is simple, acute, and very much more arcuated below than above. The inner lip exhibits no angularity at the junction of the pillar with the base of the penult volution, and is furnished with a tolerably strong subcentral prominent toothlike fold. The pillar lip is moderately arcuated, and scarcely at all reflected. There is no perforation nor umbilical chink. The usual length is only the ninth or tenth of an inch: the basal diameter is about two-thirds less.

" The animal throughout is pale frosted yellow, inhabiting a light horn-coloured spiral shell of six or seven very little raised volutions. The mantle is simple. The head is a very long flat muzzle with a subcircular terminal very flat disk, issuing between the tentacular veil and the foot, and can be extended to concurrent length with the latter organ. The tentacula are bevelled as the awl, broad, flat, rather larger than in its congeners of the same size, and have their terminations with rounded sublanceolate points; eyes immersed in the skin at the internal bases, but not quite so close together as in some of the other species. Foot short, truncate in front, slightly notched in the centre, labiated, rounded behind, when at rest somewhat elongated, though not much pointed on the march, carries the very light horn operculum, having oblique striæ of growth, on a simple lobe advanced nearly to the junction of the foot with the body. The foot has an inconspicuous central longitudinal line on the sole. Branchiæ and reproduction? The animal described was taken with many others in the littoral zone, but I believe it also inhabits the laminarian and coralline regions."—Clark, MSS.

Although by no means abundant in the living state it appears to be met with in very many localities, and to extend throughout the coast of the United Kingdom. From the ample list in Mr. Jeffreys' Monograph we extract the following: Salcombe Bay, Exmouth, and Torquay in South Devon; Weymouth; Scarborough; Northumberland; Berwickshire; Isle of Man; Tenby; Swansea Bay; Dublin and Bantry Bays; Galway; Lerwick; Aberdeenshire; western shore of Scotland.

O. eulimoides, Hanley.

Whorls smooth, a little flattened; spire shorter than, or barely exceeding, the body, of which the basal declination is gradual. Mouth rather effuse at the base, occupying half, or nearly so, of the total length. Pillar lip elongated, straightish, rather broadly reflected; fold distinct, rather high up. Axis imperforated.

Plate XCV. fig. 1, 2, 3.

Turbo pallidus, (not of Mont.) Turt. Conch. Diction. p. 223.
Odostomia unidentata, Fleming, Brit. Animals, p. 310 (teste Jeffreys). — Macgilliv. Moll. Aberd. p. 154 (teste Jeff. from specimens).
„ *Eulimoides*, Hanley, Proc. Zool. Soc. 1844, p. 18; Brit. Marine Conch. p. xxxvi. fig. 12.
„ *crassa*, Thompson, Ann. Nat. Hist. vol. xv. p. 315, pl. 19, f. 5 (from type).
„ *pallida*, Alder, Cat. Moll. Northumb. and Durh. p. 51 (no description).—Jeffreys, Ann. Nat. Hist. new ser. vol. ii. p. 335.
„ *notata*, Jeffreys, Ann. Nat. Hist. new ser. vol. ii. p. 336.

This species is what is usually marked in cabinets as the *pallida* of Montagu, with whose description, figure, and specimen, it is decidedly at variance.

In the more characteristic examples the shape is fusiform oval, but a considerable latitude of form seems permitted to this species, the spire being sometimes stunted, at other times very considerably produced. It is glossy, sometimes thin and slightly transparent, sometimes opaque and solid, of a milk-white hue, and either smooth or merely microscopically striolated in a spiral direction. A rare variety, however, adorned with regular spiral costellæ, has been taken in Galway. There are six convex and well defined whorls, that are more slanting above, more perpendicular and rounded below, of rather quick longitudinal increase, and often slightly shouldered. The penult turn, viewed dorsally, is almost equal to the rest of the spire: the apex is rather blunt. The suture is simple, though well marked, and is more or less oblique. The body, which is not at all swollen, but more usually is flattened in the middle, is in general rather longer than the spire; the latter, however, slightly exceeds the former in some large individuals we have taken in the Channel Islands; there is usually a slight attenuation of the base, whose declination is gradual and somewhat convex. The mouth, which is a little disposed to expand, occupies nearly one-half the length of the shell, is of an elongated oval figure, acuminately contracted above, and rounded, though not broadly so, at the somewhat effusely produced base. The outer lip is simple, acute, and more or less arcuated: the throat is quite smooth. The much elongated and scarcely curved pillar lip is broadly reflected and furnished with a more or less strong, though retired, fold (the amount of whose development seems variable), which is not central, but lies much nearer to the upper or narrower extremity of the aperture. There is no distinct umbilicus, but a more or less manifest chink, and a linear indentation behind the pillar lip. The ordinary length of examples is only the fifth of an inch, but they sometimes grow to a quarter of an inch long, in which case the spire is generally more produced than ordinary. Another variety, in which the spire is shorter than the mouth, has the whorls so shouldered, as actually to be scalariform. The single specimen from which the *O. notata* was constituted, appears to us to be a broken-mouthed solid variety of this species, in which the whorls are rounder than usual, and the spiral striulæ a little more manifest.

"The mantle of the animal is plain. The head is a short muzzle, marked on each side with a pale yellow longitudinal line, mouth vertical; the head issues between the foot and tentacular veil; the tentacula coalesce at the base and are short, subtriangular, bevelled like the awl, not pointed, setaceous, flattened, and in some animals the yellow white ground colour is suffused with sulphur yellow, each has also a longitudinal intenser line running between the bevels, the eyes are at their internal angles, planted in the skin. The general colour of the animal is pale yellowish white. The foot is short, truncate in front, auricled, but not emarginate in the centre, nor hollowed out as in *O. acuta;* it is rounded posteriorly and terminates suddenly in a short blunt point, it is powdered on its upper surface, with pale gold-colour minute dots, and in some specimens with sulphur yellow points; beneath the same colours prevail, though less intensely; a simple upper lobe carries a light corneous suboval striated operculum. This species is far more variously coloured than any of its congeners I have seen. The minute branchial plume, the only one I have observed, was found under the mantle at the usual place. The anal pellets were seen discharged from the right side. The reproductive and lingual organs are unknown. This species differs nothing in essentials from *O. acuta ;* the only variations are of colour, and in the anterior part of the foot not being hollowed out. There are five or six varieties, which merely differ in the contour of the shells and slightly in the coloration. The principal habitat of this species is at the back of the auricles of the *Pecten opercularis*, from the coralline zone, where they may be seen in clusters, imbedded in animal mucus. This is the most common species."—Clark, MSS.

A list of localities would be superfluous. There are few explored portions of our coast, where the dredge fails to procure it; it more especially, however, abounds on the coasts of South Devon and Dorset.

O. dubia, Jeffreys.

Oblong-conoid, smooth, ivory-white, subperforated; whorls convex, but not ventricose, of quick increase; body nearly equal to the spire, not at all angulated at its periphery, a little produced at the base. Mouth narrow, gradually and acutely contracted above, not large; pillar lip a little curved, not broadly reflected; fold distinct but retired; throat smooth.

Plate XCIV. fig. 8.

Odostomia dubia, Jeffreys, Ann. Nat. Hist. new ser. vol. ii. p. 338.

The form of this negatively characterised *Odostomia*, which is thin, glossy, semitransparent, smooth, and white, is suboval, but tapers above to a small but blunt apex. It is composed of from five to five-and-a-half volutions, that are convex or even somewhat rounded, of quick longitudinal increase, much attenuated posteriorly, but neither flattened nor scalar beneath the moderately oblique and very distinct (yet not canaliculated) suture that divides them from each other. The penult, and often the antepenult turn likewise, is decidedly high. The body, which vies with the spire in length, is neither at all angulated at the periphery, nor flattened below it, but gradually attenuates, with a gently rounded declination, at the somewhat produced base. There is a slight umbilical chink, but not a decided perforation. The mouth, which is rather large, and more or less elongated, has an oval-acute figure, being rounded below, and gradually contracted above ; it usually occupies from two-fifths to three-sevenths of the entire ventral length. The outer lip, which is quite smooth internally, is convex above, and well arcuated below. The pillar-lip, which forms one continuous curve with the inner lip, is elongated, straightish, scarcely at all reflected, and not appressed ; it is furnished with a small and retired, yet tolerably distinct, fold, that is seated rather above the middle of the aperture. Very few examples exceed the eighth of an inch in length.

The ascertained localities are only the following—Southampton, Torquay, Exmouth, west coast of Scotland, Lerwick (Jeff. Ann. Nat.).

The species approaches more closely than we could wish to the preceding, of which, perchance (for much latitude of form seems permitted to the *Odostomiæ*), it may after all prove an aberrant variety. Yet, when mixed with that species, the eye will almost invariably detect it at a glance, by its much shorter and not effuse mouth, the greater curvature and lesser reflection of the pillar lip, its umbilical chink, &c.

O. ALBA, Jeffreys.

Thin, smooth, subperforated, oblong-conoid; whorls more or less rounded, of more or less abrupt elevation; spire scarcely, if at all, longer than the body: suture peculiarly profound. Mouth large, broadly rounded below, not very acutely contracted above: outer lip arched; reflection of the pillar lip very slight; fold very retired.

Plate XCVI. fig. 9.

Odostomia alba, JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 337.

After fruitlessly endeavouring to ascertain the limits of this species, baffled by the scarcity of specimens, we have been compelled to content ourselves with describing the dozen or so of individuals, from which Mr. Jeffreys originally constituted his species. Whether a longer suite might not even connect the shell with *Rissoides* (which the young are very like), or *dubia*, we know not; the former chiefly differs in being imperforate, the latter by its greater solidity, stronger tooth, and the less broadly rounded base of its aperture. Even the supposed Exmouth variety of *nitida* approaches the species with a suspicious degree of closeness.

The shell appears to be of a more or less oblong-conoid shape, and to taper above to a tolerably fine yet little prominent apex. It is smooth, thin, snow-white, and composed of six rather large volutions, that are divided by an oblique simple yet very profound suture. Their longitudinal increase is rapid, so that the penult turn is high, and although they are not truly scalar (except, perhaps, one or two of the earlier whorls), they swell out above more or less abruptly from the suture, instead of shelving gradually thence (as in *dubia*). They are more or less ventricose, though variable as to the degree of their tumidity; sometimes they are a little depressed in the middle, but are never planulate posteriorly. The body, which, in the adult, seems always to be more or less swollen, is about equal in dorsal length to the spire, occupying from three-sevenths to four-sevenths of the total length; its basal declination is gradual and rounded. From two-fifths to three-sevenths of the ventral length is filled by the aperture, which is ovate, projecting, more or less ample, rather broadly rounded, somewhat disposed to expand below, and not very acutely contracted above. The outer lip is acute, simple, and arcuated throughout; the throat is quite smooth. The posterior portion of the inner lip is rounded; the pillar lip is elongated, very thin, and usually more or less curved; even when reflected (and the replication, especially above, is so narrow as scarcely to be apparent) it is so little appressed that the axial subumbilicus is clearly manifested. The fold is so internal as to be almost hidden, but when the outer lip is broken away proves to be of moderate bigness. Length, two lines; breadth, one line. A variety exists, which is very like *dubia* in shape, being narrower and less ventricose in all its proportions.

The animal has not been observed.

Oxwich Bay near Swansea, and Bantry Bay, in Ireland, are the only localities recorded by Mr. Jeffreys. Some peculiarly squat and scalariform individuals (apparently immature) have been taken by Mr. Barlee in Zetland.

O. NITIDA, Alder.

Ovate, thin, smooth, shining, transparent, umbilicated; whorls of rapid growth, ventricose, only five: mouth ovate, almost equal to the spire above it; pillar lip much elongated, and, as well as the outer one, much arched, very narrowly reflected; fold small, but distinct.

Plate XCIV. fig. 6.

Odostomia nitida, ALDER, Ann. Nat. Hist. vol. xiii. p. 326, pl. 8, f. 5; Catal. Moll. Northumb. and Durh. p. 52. — JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 337.

We have only seen a single example (that from which the species was originally constituted) of this rare little shell, whose characteristics, though not striking, are sufficiently dissimilar to those of its allied congeners, to render its recognition an easy task. Its form is ovate-conical, and it is thin, shining, semitransparent, smooth, and white. The increase of the volutions in both directions is rapid; the spire, which is composed of barely four turns, quickly tapering to a very blunt apex. The whorls are tumid and but moderately high; the principal ones, instead of shelving above, project there abruptly in an obtusely scalar fashion; they, likewise, incline a little inward at their bases; hence the slightly oblique line of division is peculiarly well pronounced. The basal declination of the body-whorl, whose periphery is not at all angulated, is well and gradually rounded. The mouth occupies three-sevenths of the entire length, is exactly ovate, and not angularly contracted at its upper end; the throat is quite smooth. The outer lip is continuously arcuated, and projects very decidedly at the anterior extremity. The pillar-lip is peculiarly elongated, filling two-thirds of the length of the inner lip; it is very much arcuated, and very narrowly reflected. The fold is distinct, but not large; it is situated at about one-third the distance from the posterior corner of the aperture. The axis is perforated by a very distinct umbilicus. The length of the specimen, which is about twice its breadth, is only the tenth of an inch. It was taken in sand from Tynemouth (Alder). Torquay and the west of Scotland are mentioned as additional localities by Mr. Jeffreys.

Mr. Clark has forwarded us the following account of an animal which he doubtfully refers to the present species. The shell, though closely connected and probably a variety, differs in some respects from the type, the extreme tumidity of whose volutions may possibly be accidental; we have consequently given a brief description of it below.*

"Animal with the mantle not produced beyond the margin of the shell. Head short, flat, not grooved nor cloven, gently arcuated at its terminus; it issues between the foot and tentacular veil, and with the tentacula extends a little beyond the foot. The veil is entire, with a sweeping indentation, which resolves itself at the right and left angles, into two very short broad awl-shaped bevelled blunt tentacula, on each of which there is an opaque linear stripe from base to point. They are hyaline, setaceous, with the tops marked with a round opake white dot, which in certain aspects gives them a clavate appearance, and at the under part they are aspersed with minute sulphur dots. The eyes are large, very black, imbedded in the skin, a little below the origin of the tentacula at the internal bases. The foot is very short, strictly truncate in front, scarcely auricled, with, at half extension, a very rounded posterior termination; but on the march it tapers to a lanceolate point. It carries, at a little distance from the terminus of the pedal disk, on a simple upper lobe, a slightly arcuated suboval light horn-coloured operculum, which has its columellar edge raised and reflected outwardly throughout its length, the nucleus being in the centre, from whence the striæ of increment radiate conspicuously to the outer margin. Its structure altogether is similar to the operculum of *Jeffreysia diaphana.* The foot, above and below, the body generally, and the neck and head, are of a rather opake white ground colour, sprinkled irregularly, and not very thickly, with bright sulphur minute points. The animal is lively, moves with celerity, displays its organs, and swims on the back. It is an inhabitant of the finer *algæ* of the pools of the lower levels of the littoral line at Exmouth. It is a most polymorphous species, as out of nearly one hundred specimens, scarcely two are alike; varying in tumidity, length, and colour; indeed, every hundred yards of coast has its variety."—Clark, MSS.

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* Shell (Plate XCIV. f. 7) of a somewhat conoid ovate or subovate shape, being quickly attenuated above to a small blunt apex; very thin, subperforated, transparent, shining, white or yellowish white, smooth or nearly so. Whorls much tapering, of very quick longitudinal increase, more or less ventricose, deeply divided. Body large, occupying half the entire length, well rounded, but rather gradually declining below. Nucleus not very oblique. Mouth rather capacious, somewhat ovate or rounded ovate, equal in length to the four turns above it, sometimes a little disposed to expand anteriorly. Outer lip arched throughout, smooth within. Inner lip arcuated and peculiarly elongated; its reflection narrow, and not appressed; the fold extremely small and somewhat retired. Length scarcely a line.

O. GLABRATA, Mühlfeldt ?

Nearly oblong, thin, smooth, shining; whorls ventricose, rather oblique, of rapid increase, only four and a half, the last equal to the rest united; outer lip arched; pillar lip greatly arched; fold retired, and obscure; no umbilicus.

Plate XCVIII. fig. 3.

Helix glabrata, MEG. MÜHLF. Verhandl. Berlin. Gesel. 1824, vol. i. p. 218, pl. 3 (= 9), f. 10 ?
Rissoa punctulum, PHILIPPI, Moll. Sicil. vol. i. p. 154, pl. 10, f. 11 ?
„ *glabrata*, PHILIPPI, Moll. Sicil. vol. ii. p. 130 ?

Mr. Barlee has very lately forwarded us three examples of a species of *Odostomia*, that will not specifically coincide with any of our native shells. It approaches so nearly to the general aspect of *Rissoa glabrata* (as figured by Philippi; we do not possess the shell) that, although no mention is made by that author of its obscure tooth, and the whorls are described as only moderately convex, we prefer to use the appellation *glabrata* (since it has not, to our knowledge, been applied to a member of this genus, and consequently may be retained, even if the conjectured identification prove erroneous) rather than fabricate a new epithet for a possibly known object. This species, which is very thin (and consequently more or less semi-transparent) is perfectly smooth, and of an uniform shining white; it has a tapering oblong shape, and ends (or rather commences) in a large and very blunt, but not depressed, somewhat mammillary apex. The spire, which merely equals the length of the body-whorl, is composed of only three or three and a half turns, which are of quick longitudinal increase (hence the penult is high), and are very profoundly divided, owing to their being more or less ventricose, by the simple and moderately oblique suture; they manifestly taper above, swell out rather below the middle, and incline inward at their bases. The anterior slope of the subventricose body is gradual and rounded; its periphery is not in the least angulated; there is no umbilicus, but at most an indented chink or a slight cleft. The mouth, which has a moderate projection, fills nearly three-sevenths of the entire length; it is of an oblong-ovate figure, being well rounded below, and gradually attenuated (not sharply contracted) above. There is a decided basal recedence of the outer lip, which is simple, acute, and continuously arched; it is quite smooth internally. The inner lip runs, for the most part, in a straightish oblique line, and is furnished in the middle with an obscure blunt retired oblique fold; the pillar lip, however, curves anteriorly, and is moderately but not broadly reflected throughout. The basal diameter is about two-fifths of the length; the latter is only the tenth of an inch.

The animal was not observed; the shells were taken in Zetland.

O. Rissoides, Hanley.

Imperforate, tapering, extremely thin, not much shining, smooth, but usually with scratch-like lines of increase; whorls merely convex, of quick increase; penult rather high; apex blunt: reflection of the pillar lip extremely slight, if any: fold, small and very retired, yet distinct.

Plate XCVI. fig. 4, 5.

Odostomia scalaris, Macgilliv. Moll. Aberd. p. 154 (copied Brit. Marine Conch. p. 259); and Brown, Ill. Conch. G. B. p. 129, as *Jaminia scalaris*) ?

„ *Rissoides*, Hanley, Proc. Zool. Soc. 1844, p. 18; Brit. Marine Conch. p. xxxvi. (f. 9, badly). — Jeffreys, Ann. Nat. Hist. new ser. vol. ii. p. 337.

This shell is extremely thin and semitransparent, a little shining, of an impure white hue, and a narrow suboval figure. The surface is smooth, but is curiously marked with scratch-like lines of increase. There are from five to six volutions, that rapidly taper to a small blunt and rather depressed apex; they are of quick longitudinal increase, convex, not truly scalar, though sometimes having a slight appearance of being so, and divided by a more or less oblique suture, which, although not canaliculated, is very distinctly pronounced owing to the basal swell of the turn above it: the penult whorl is rather high. The periphery of the body, whose length is about equal to that of the spire, is not at all angulated; its basal declination, though rather abrupt, is well rounded. The moderately large mouth, which usually occupies about three-sevenths of the entire length (sometimes, indeed, even half), is subacutely ovate, being broadly rounded below and slightly contracted above. The outer lip is smooth within, and is more or less projecting and arcuated. The upper or posterior portion of the inner lip is convex; the pillar lip, which occupies nearly two-thirds of that side of the aperture, is extremely thin, very narrow, scarcely in the least reflected, at first subrectilinear, and then curving into the basal arch. The fold is small and very obscure; it lies very far back, but considerably above the middle of the mouth. The axis is imperforated. An eighth of an inch is the ordinary length of individuals.

The following localities are copied from Mr. Jeffreys' list in the "Annals of Natural History:" Guernsey; Burrow Island in S. Devon; Whitesand Bay in Cornwall; Exmouth; Scarborough; Aberdeen; Lerwick; Roundstone and Arran Isle in Galway; Tenby and the vicinity of Swansea.

We have provisionally regarded the *O. albella*[*] of British writers (Alder, Cat. Moll. Northumb. and Durh. p. 51; Jeffreys, Ann. Nat. Hist. new ser. vol. ii. p. 338) as a turreted variety of this species, but have given the description in full, since the shell has not yet been described by any British writer.

It is of an abbreviated turreted figure, extremely thin, of a squalid white or very pale fulvous hue, semitransparent, with a slight resinous gloss, and almost smooth, being marked only with some longitudinal scratch-like wrinkles of increase, that are always, however, more or less conspicuous. There are six moderately convex whorls, whose longitudinal increase is rapid; they taper above, where they are either obtusely subscalar, or swell out at once from the moderately oblique and strongly pronounced, yet not canaliculated, suture; the penult turn is rather high; the apex is obtuse. The periphery of the body, which fills two-fifths of the dorsal length, is not at all angulated; its basal declination is well rounded, but is sometimes much more gradual than at other times, usually, however, it is a little produced at that portion which forms the anterior extremity of the aperture. In adult specimens the mouth, which has an acuminated oval contour, occupies from one-third to two-fifths of the total length; it is a little produced at the base, where it is rounded, yet not very broadly, and is contracted above by the swell of the preceding volution. The outer lip is convex above, and arcuated below. The pillar lip is elongated, only moderately curved, very narrowly when at all reflected, and furnished with an obscure retired fold, which is placed above the middle of the inner lip. There is no true umbilical perforation, but at most a mere chink. Few examples measure quite two lines in length, and three-quarters of a line in basal diameter.

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[*] Supposed to be the *Turbonilla albella* of Lovén (Index Moll. Scand. p. 19; Ofversigt Vetensk. Akad. Förhandl. 1846, pl. 1, f. 11), but the identification is not positive.

The variety which forms the *O. turrita* of Alder (not Hanley) is slightly more produced and cylindrical, and has the two lips a little straighter in consequence.

The shell is stated by Mr. Jeffreys to be found in the following localities: Guernsey; Torquay; Tynemouth and Cullercoats in Northumberland; Lerwick, Oban, and elsewhere on the west coast of Scotland; Roundstone in Galway.

O. CYLINDRICA, Alder.

Almost cylindrical, smooth, but with an obscure spiral ridge or two running in a line with the upper corner of the aperture; whorls more or less rounded, yet often subscalar, deeply divided, the penult high; body short; apex peculiarly blunt; fold obsolete: no umbilical crevice.

Plate XCVI fig. 7.

Turbo nivosus, MONT. Test. Brit. vol. ii. p. 326, from type.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 163. — TURT. Conch. Diction. p. 202. — FLEMING, Brit. Animals, p. 300. — Brit. Marine Conch. p. 171.—DILLW. Recent Shells, vol. ii. p. 839.—WOOD, Index Test. pl. 31, f. 56.

Odostomia cylindrica, ALDER, Ann. Nat. Hist. vol. xiii. p. 327, pl. 8, f. 14.—JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 339.

Cingula nivosa, Brit. Marine Conch. p. xliii.

Pyramis nivosus, BROWN, Ill. Conch. G. B. p. 14, pl. 9, f. 25, 26.

Actual comparison of the solitary type of Montagu in the British Museum, with characteristic specimens of the *O. cylindrica* kindly sent us by Mr. Alder, enable us to positively assert the identity of the two shells. So brief and inadequate was the description of the earlier writer, (who did not descry the more important features) that it was impossible for any naturalist to recognize the object he intended; hence, we consider he has forfeited his claim to priority.

The shell is subcylindrical, narrow, tapers slightly to an extreme blunt apex (the large nucleus being obliquely sunken into the summit of the spire) white, glossy, and semitransparent. Though smooth to the eye, a careful scrutiny will detect from one to three obscure spiral ridges or striæ that revolve around the body in a line with the upper part of the mouth, but do not extend to the extreme base. There are only four or five rounded whorls, which are of moderately fast longitudinal increase, and are profoundly divided by a moderately oblique and rather broad suture, above which they sometimes (but not invariably) arch in so abruptly as to give a somewhat flat-topped appearance to the succeeding volution. The body is rather short, almost cylindrical, and indistinctly angulated at its periphery; its basal declination is rounded. The mouth, which scarcely occupies more than a third of the entire length (often, indeed, less) is subovate, acutely angulated above, and rather bluntly rounded at the base or anterior extremity. The outer lip is simple and acute; above it is merely convex, below it is abruptly arcuated; within it is quite smooth. The pillar lip is more or less curved, and not very long; it is narrowly reflected, and has no adjacent umbilical crevice, but at most a linear depression. The fold is almost always obsolete; when visible at all, it lies rather above the middle of the inner lip, and is small and peculiarly retired. Our examples measure a single line in length, and fully two-thirds less across their base.

Mr. Jeffreys has indicated the following localities: Scarborough; Ilfracombe; Land's End; Whitesand Bay in Cornwall; Burrow Island, South Devon; Guernsey; Cork

Harbour; Kilkee. Montagu obtained his specimen from sand in the south of Devonshire.

There seem occasionally some obsolete longitudinal pliciform wrinkles on the upper part of the whorls, but they are never developed into regular folds.

O. INSCULPTA, Montagu.

Oblong-turreted; whorls spirally sulcated; pillar-lip elongated, narrow, furnished with a distinct pliciform twist.

Plate XCVI. fig. 6.

Turbo insculptus, MONT. Test. Brit. Suppl. p. 129. — TURT. Conch. Diction. p. 221.
Voluta insculpta, DILLW. Recent Shells, vol. i. p. 509.
Odostomia „ (not of Dekay) FLEMING, Brit. Anim. p. 310.—MACGIL. Moll. Aberd. p. 329.—Brit. Marine Conch. p. 173.—JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 342.
Jaminia „ BROWN, Ill. Conch. G. B. p. 22.

The present species, from its sculpture, cannot well be confounded with any other of our native species, unless perhaps with *striolata*, from which its shape and proportions distinguish it, or with *Warrenii*, which neither possesses a fold, nor has sulci on the whorls of its spire.

It is oblong-turreted, a little transparent, rather thin, glossy, uniform white, and spirally sulcated. The grooves, which are strong, close, and regular, do not quite extend to the suture; indeed, except upon the body, where they encircle three-fourths of the surface, they only traverse the lower half of each turn; they have, often, a punctured look. The spire, which is about equal in length to the body, is composed of four tapering and convex whorls, that are of rather quick longitudinal increase (hence the penult turn is more or less high), and are deeply divided at the suture. The obliquely set nucleus is peculiarly sunken into the blunt apex. The body, whose basal declination is gradual and convex, is broadly rounded at its periphery. The shape of the mouth, which occupies three-sevenths of the entire length, is nearly elliptical; it is contracted at both extremities, being rotundately so below, where it is disposed to become effuse, and acutely so above by the convex base of the preceding turn. The outer lip is thin, devoid of internal sculpture, much arcuated at the base, and merely convex posteriorly. Its edge, in our best preserved specimen (which contains the animal), exhibits a slight sinus at its junction with the body, and then swells out without any proportionate retrocession at the base. The pillar-lip is long (filling rather more than half the length of the inner lip), straightish, and narrow; in curling back it exposes an umbilical crevice which scarcely amounts to an axial perforation. A rather small and retired pliciform twist lies almost in the middle of the left lip. Three-fourths of a line is the basal diameter of an example that measures nearly the sixth of an inch in length.

The animal has not been examined.

The species is very rarely obtained, and much more frequently dead in shell-sand, than in a living state. Torbay, Burrow Island, and elsewhere in S. Devon; Tynemouth and Cullercoats; Tenby and Linny Bay in Pembrokeshire; Langland Bay near Swansea; Aberdeenshire; Ullapool, Ross-shire; Oban; Loch Fyne; in forty fathoms, five miles east of Lerwick, Zetland; Dunvegan, Skye, Hebrides. (Jeff. Ann. Nat.).

O. OBLIQUA, Alder.

Body equal in length to the spire; whorls convex, quite smooth, of rapid longitudinal increase : no umbilicus : no fold.

Plate XCVI., fig. 1.

Odostomia obliqua, ALDER (not Jeffreys), Ann. Nat. Hist. vol. xiii. p. 327, pl. 8, f. 12.

„ *diaphana*, JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 341, *young*.

This extremely rare shell somewhat reminds one of the *Rissoa vitrea*, and like it lies on the confines of its genus. The *Warrenii* seems to be its nearest congener, and, except in sculpture, comes very close to it, so much so, indeed, that the localities usually ascribed to the latter belong more appropriately to the former species. It has an acuminated oblong figure, is thin, semitransparent, a little glossy, quite smooth, and of an uniform squalid white. There are only five volutions, which are of very rapid longitudinal increase (so that the penult turn, when viewed dorsally, is decidedly high), and are deeply divided by an oblique and simple suture : they are usually more rounded and perpendicular below, more shelving and merely convex above ; those of the spire are subventricose and quickly tapering ; the apical nucleus is moderately pointed and somewhat twisted aside. The body, which is fully equal to the spire in length, and often, indeed, exceeds it, is narrow, broadly rounded at the periphery, and convex in the declination of its very gradually attenuated anterior extremity. The narrow aperture, which is about equal to the spire in length, is oblong-ovate, and gradually contracted posteriorly by the moderately convex swell of the base of the preceding whorl. The outer lip is simple, very acute, smooth within, at first but slightly convex, subsequently arcuated at its junction with the pillar-lip. This last, which usually recedes far below the level of the opposite lip, is narrow, thin, and elongated, occupying nearly two-thirds of the length of the aperture; it is straightish above, obliquely curved below, and not reflected in the most perfect example we have seen, but in some broken-mouthed individuals it appears in the shape of an appressed lamina. There is rarely the least vestige of a fold, but when present it is very oblique, retired, and rudimentary. The axis is imperforated. The breadth of the shell is only a line; its length is occasionally the fifth of an inch.

Very few examples have been taken of this extremely scarce species. Mr. Alder obtained his specimens at Tynemouth; Mr. Hanley dredged a single dead one at Herm, near Guernsey, in seven or eight fathoms depth; and Mr. Clark from deep water in the offing at Exmouth.

O. Warrenii, Thompson.

Base with spiral striulæ, elsewhere smooth. Spire not much elongated. Mouth rather long: no fold on the pillar.

Plate XCVI. fig. 2, 3.

Rissoa Warrenii, Thompson, Ann. Nat. Hist. vol. xv. p. 315, pl. 19, f. 4.
Turbonilla obliqua, Lovén, Index Moll. Scandin. p. 19?
Odostomia ,, Jeffreys, Ann. Nat. Hist. new ser. vol. ii. p. 341.
,, *decorata* (not of Zeitschr. Malak.), Jeffreys, Ann. Nat. Hist. 1850, p. 109.

A comparison of the types or originally described examples of the *decorata* and *Warrenii* has fully convinced us of their identity. The specific characteristics are more strongly developed in the immature dead specimens, which form the *decorata* of cabinets, than in the fine living individual from which the earlier known *Warrenii* was described. For in this last the spiral lines upon the base are comparatively obscure, and the subscalar structure of the volutions whose lower portions in this variety, in lieu of being perpendicular, are somewhat more ventricose, is less apparent, being, as it were, convexly bevelled off.

The shell is slender, tapering to a moderately fine point, thin, transparent, lustrous, and of an uniform white or sallow white tint. To the eye it seems smooth or nearly so, but on careful examination displays numerous and regularly impressed spiral lines on the basal half of the body whorl, besides irregularly diffused and very indistinct, longitudinal wrinkles of increase. An oblique and very distinct, yet not canaliculated, suture deeply divides the five rounded turns of the spire from each other. The whorls are of rapid longitudinal increase (hence the penult is decidedly high), and are more or less subscalar from the suddenness of their superior projection : the apical nucleus is less prominently and obliquely disposed than usual, and sinks into the summit of the shell. The body is almost equal to the spire in length ; its periphery is not at all angulated ; its basal declination is gradual, convex, and somewhat produced. The mouth, which occupies from about two-fifths to three-sevenths of the entire length, is narrow and oblong-ovate ; it is suddenly contracted above by the swollen base of the preceding whorl, and is somewhat effuse, and not very broadly rounded at the base. The outer lip, which is simple acute, and disposed to curl inwards rather than expand, is at first but moderately convex. The much receding pillar lip is devoid of any fold ; it occupies nearly three-fourths of the total length of the aperture, and is very slightly curved, and not reflected. There is a small but distinct umbilicus. A single line was the basal diameter of an individual that measured the fifth of an inch in length.

Portmarnock, in Dublin Bay, was the spot from whence Mr. Warren procured the original type of the species. It is a very rare shell, but is comparatively plentiful dead in shell-sand, from Burrow Island, S. Devon; and has also been taken at Falmouth; on the southern and western coast of Ireland; and the west coast of Scotland.

O. TRUNCATULA, Jeffreys.

Turreted-subcylindraceous, transparent, sculptured, though very obscurely: whorls six or seven, high, convex, of slow longitudinal increase. Mouth not more than a third of the entire length: pillar with a pliciform twist.

Plate XCVI. fig. 8.

Odostomia truncatula, JEFFREYS, Ann. Nat. Hist. new ser. 1850, p. 109.

This very interesting shell combines in its characteristics the features of *Odostomia*, *Chemnitzia*, and *Truncatella*. It is turreted, tapering, subcylindrical, extremely thin, more or less transparent, and of an uniform and somewhat glossy white. At the first glance it appears to be smooth or nearly so, but on careful examination, displays both slanting longitudinal wrinkles and slightly elevated spiral lines. The former are regular, though obscure, and are chiefly evident on the upper portion of the volutions, imparting to them a kind of subsutural puckered appearance: the latter do not pervade the entire surface, are more apparent in some examples than in others, and are chiefly visible upon the basal portions of the smaller turns, and occasionally upon that of the final one likewise. The spire, whose nucleus is not much distorted, but sinks into the apex, is composed of five or six rather high and convex whorls, which are of slow longitudinal increase, and which so arch inwards below as to appear abruptly divided by the oblique and profound suture. The body, which is not swollen in the middle, and is not angulated at the periphery, has a gradual and convex basal declination. The suboval mouth occupies from one-third to one-fourth only of the entire length, and is a little produced or slightly effused at the bluntly rounded anterior extremity; the posterior contraction is rather sudden. The peristome is continuous in the adult. The edge of the acute and merely convex outer lip, which is more inclined to curl inwards than expand, is at first very indistinctly subsinuated, then swells out, and finally again recedes. The throat is quite smooth. The pillar lip, which is thin, much elongated, and a little reflected, yet not appressed, is but little arcuated; the pliciform twist, with which it is furnished, is distinct, but not striking. There is no umbilicus. The basal diameter of an individual that measured fully two lines and a half in length, was only three-quarters of a line.

Still finer intermediate striulæ, that are parallel to the longitudinal wrinkles, occasionally present themselves beneath the sutures.

The refuse of the Plymouth trawl-boats furnishes us with live specimens of this interesting species.

O. INTERSTINCTA, Montagu.

Turreted, not scalar, with closely disposed longitudinal ribs, not clathrated; body much shorter than the spire: a strong though remote tooth upon the pillar.

Plate XCVII. fig. 1.

Turbo canaliculatus, ADAMS, Trans. Linn. Soc. vol. iii. p. 253? (from which FLEMING, Brit. Animals, p. 300).
,, *interstinctus* (scarcely of Adams), MONT. Test. Brit. vol. ii. p. 324, pl. 12, f. 10.—TURT. Conch. Diction. p. 223 (colour excepted).—ALDER, Cat. Moll. Northumb. and Durh. p. 52.
Voluta interstincta, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 131.—DILLW. Recent Shells, vol. i. p. 509.—WOOD, Index Testaceolog. pl. 19, f. 25.
Odostomia interstincta, FLEMING, Brit. Animals, p. 310.—MACGILLIV. Moll. Aberd. p. 155.—Brit. Marine Conch. p. 173.—JEFF. Ann. Nat. H. (new ser.) vol. ii. p. 343.
,, *oblonga*, MACGILLIV. Moll. Aberd. p. 157 (fide Jeffreys, from type); copied, Brit. Marine Conch. p. 260, and BROWN, Illust. Conch. G. B. p. 130 (as *Jaminia oblonga*).
Jaminia interstincta, BROWN, Illust. Conch. G. B. p. 21, pl. 9, f. 10.
,, *obtusa*, BROWN, Ill. Conch. G. B. p. 22, pl. 9, f. 38.
Pyramis Lamarckii, BROWN, Ill. Conch. G. B. p. 15, pl. 9, f. 39.

Like most of its genus, the shell is of a shining snow-white, and very slightly transparent; it is turreted, but not very slender, and varies as to the degree of attenuation in the spire. Its surface is adorned with a good many, but not crowded (except occasionally upon the body), nearly straight and perpendicular, strong, square-cut, longitudinal ribs, that are usually obsolete upon the lower portion of the body, but extend upon the other whorls from top to bottom; the profound intervals (at least upon the spire and upper half of the final coil) are quite smooth, except a single obscure spiral raised line, that usually revolves immediately over the broad and profound oblique suture. For the most part, likewise, there are two spiral raised lines on the lower part of the body, that run in a line with the upper extremity of the aperture ; more rarely they both of them are continued upon the penult turn. The spire is composed of five tapering volutions, which are a little convex, of slow longitudinal increase, moderately elevated, and not scalar, but rather abruptly inclining inwards at their bases. The apex is blunt. The body, whose basal declination is abruptly rounded, is generally rather flattish posteriorly. The mouth occupies nearly one-third of the total length, and is of a subrhomboid oval figure, the scarcely convex base of the preceding turn forming an angle with the columella; the posterior contraction is rather sudden. The acute and simple outer lip, which is straightish or only slightly convex above, arches or rather slants in more or less abruptly anteriorly, and forms an angle with the pillar lip. This last, which is straightish or but slightly curved, is peculiar in being broadly erect, folding back slightly, however, near the base: it is flanked by a more or less perceptible umbilical chink. The tooth-like fold is tolerably large, and nearly horizontal; it lies only a little above the middle of the inner lip, but so retired, that it is scarcely apparent in unworn individuals. The ordinary length of full-grown examples is the eighth of an inch; this is nearly thrice their basal diameter.

"Animal white throughout. Mantle fleshy, protruding a little beyond the margin of the aperture. Head, a narrow cloven muzzle, issuing between the foot and under the coalescing tentacular membrane. The tentacula are exceedingly short, strong, rather flat, setose, very obtusely pointed. The eyes are distinct, and immersed in the skin of their internal bases. The foot is very small and short, scarcely extending beyond the basal volution, truncate in front, moderately pointed behind, carrying on its simple upper lobe a small, corneous, striated, elliptical or suboval operculum. Branchial plume?

"This animal, like all its congeners, is lively, permitting a good examination of the organs. The individual examined, is the variety with the subrotund volutions, and is of larger growth than its congener with the more slender, subcylindrical contour, and flat, angular sutures, which may be distinct: we have not met with one alive. The aspect of this species differs from all the preceding. As to the shell it appears to be a complete *Chemnitzia*, with the exception of the pillar tooth, and there is no appreciable character in the animal to account for its presence in the shell. The animal is absolutely the same as that of *Chemnitzia*, allowing for the slight, scarcely specific variation of a little more or less long foot, muzzle, and tentacula."—(Clark MSS.).

Although the ordinary form of *Ch. indistincta* in which the whorls are somewhat swollen at their bases, and the ribs are very narrow, densely disposed, and flexuous (produced S-shaped), may easily be distinguished from the present species, the coarse and straighter ribbed variety of that shell bears so striking a resemblance to it, that were it not for its want of the tooth-like fold, it would be almost impossible to separate worn examples of the two from each other. The most constant difference appears to be that in the latter,—the intervals of the ribs on the lower portion of each volution are crossed by several spiral raised lines.

This is one of the comparatively common species of *Odostomia*, and is obtained from very many localities; it seems indeed so generally diffused that to specify localities would be superfluous: it frequents shallower water than most of its congeners.

O. SPIRALIS, Montagu.

Bluntly conic; lower half of the body-whorl spirally ribbed; elsewhere longitudinally ribbed; fold small but distinct.

Plate XCVII. fig. 2, and (Animal) Plate FF. fig. 8, 9.

Turbo spiralis, MONT. Test. Brit. vol. ii. p. 323, pl. 12, f. 9.—TURT. Conch. Dict. p. 222.
Voluta „ MATON and RACK. Trans. Linn. Soc. vol. viii. p. 130.
" *pellucida*, DILLW. Recent Shells, vol. i. p. 508.—WOOD, Index Testac. pl. 19, f. 23.
Odostomia spiralis, FLEMING, Brit. Animals, p. 310.—ALDER, Ann. Nat. Hist. vol. xiii. pl. 8, f. 13, animal (imperfect).—JOHNSTON, Berwick. Club, vol. i. p. 273.—MACGILLIV. Moll. Aberd. p. 155.—Brit. Marine Conch. p. 172.—ALDER, Cat. Moll. Northumb. and Durh. p. 52, animal.—JEFFREYS, Ann. Nat. Hist., new ser. vol. ii. p. 342.
„ *plicatula*, MACGILLIV. Moll. Aberd. p. 154, (YOUNG, fide Jeffreys, from type; copied as *Jaminia plicatula*, BROWN, Ill. Conch. G. B., p. 129).
Rissoa spiralis, BROWN, Illust. Conch. G. B., p. 13.

The peculiarity of the sculpture of this shell renders it the most easily recognizable of our British *Odostomiæ.* It ranges in shape from ovate-conic to oblong-conic, is tolerably strong, consequently not very transparent, though a little translucent, and of an uniform more or less glossy white. Numerous straight square-cut and closely disposed ribs traverse the whorls in a longitudinal direction, and extend, except upon the body, on whose lower half they are replaced by rather depressed and broadish spiral ribs, from top to bottom. Above the broad and canaliculated suture, which runs rather obliquely, they are apt to become abruptly confluent so as to form an obscure spiral costella, but this character is not always perceptible. The five whorls are more or less flattened and simple; they are of slow longitudinal increase, and taper moderately: the penult turn is not particularly high; the nucleus sinks obliquely into the blunt apex. The body, which is about equal to the spire in length, is slightly angulated at its periphery, and declines rather abruptly, though convexly, at its base. The mouth, which occupies from two-fifths to only a third of the entire length, has an ovate-acute figure, being rounded below where it is a little disposed to become effuse, and sharply contracted above. The outer lip, whose throat merely exhibits the traces of the external sculpture, is simple and acute; it is nearly straight above, and abruptly arcuated anteriorly. The pillar lip is nearly straight, and becomes broadly and flatly reflected near its union with the opposite lip; its fold is tolerably distinct, and lies rather above the middle of the inner lip. The axis is more often imperforate; there is sometimes, however, an umbilical crevice. The ordinary length of examples, is only the tenth of an inch; the breadth, in general, does not much exceed one-half this measurement.

Mr. Jeffreys, in his valuable Catalogue of the British *Odostomiæ*, considers the *Helix striata* of authors to be the fry of this species.*

The animal, in examples which we have examined at Brassay Sound in Zetland, is of a sulphur-yellow colour; its head is rather produced and rounded centrally, and flanked by two obtuse subtriangular tentacula with eyes placed at their inner bases; the foot is oblong, bilobed in front and obtusely angled, and terminates in an obtuse tail. Mr. Clark describes specimens observed by him in June, 1850, at Exmouth, as "of a hyaline white, delicately suffused with snow-white points of several magnitudes. The tentacula occupy the transverse extent of the membrane from which they originate, coalescing at their bases and diverging greatly to their points; they are short, flat, broad, bevelled, triangular, setose, with a snow-white line from base to point, which terminates in each in a round, minute, intense white flake, which gives them the aspect of being clavate. The foot carries on a plain upper lobe a pale, corneous, suboval, finely striated operculum." Professor Lovén observed the animal in Swedish specimens to be white, with a narrow, entire mentum and a foot emarginated in front.*

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* Walker, Test. Minut. f. 29, from which *Helix striata*, Mont. Test. Brit. p. 445; Maton and Rack. Trans. Linn. Soc. vol. viii. p. 204; Turt. Conch. Diction. p. 57.—*Turbo striatus*, Flem. Brit. Anim. p. 300.—*Rissoa striata*, Brown, Ill. Conch. G. B., p. 12, pl. 9, f. 22.

This species is distributed all round the British and Irish shores, so that although, like the majority of its congeners, individuals of it are not over numerous, it cannot be said to be rare or even very local. It ranges to the coasts of Sweden, but is not known to the south of Britain, and appears to be a characteristically Celtic shell.

O. DOLIOLIFORMIS, Jeffreys.

Subglobose, spirally costellated or sulcated; no longitudinal ribs. Body longer than the spire.

Plate XCVII. fig. 5.

WALKER, Testac. Minut. Rariora, f. 55? from which *Turbo Sandvicensis*, ADAMS, Micros. pl. 14, f. 23; MONT. Test. Brit. vol. ii. p. 332; MATON and RACK, Trans. Linn. Soc. vol. viii. p. 187; TURT. Conch. Diction. p. 230.—*Odostomia Sandvicensis*, FLEMING, Brit. Animals, p. 310; Brit. Marine Conch. p. 173.—*Rissoa Sandvicensis*, BROWN, Ill. Conch. G. B., p. 13, pl. 8, f. 26.

Odostomia dolioliformis (not *doliolum* of Zeitschr. Mal.), JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 342.

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* Ofversigt af Kongl. Vet. Akad. Forh. 1846, p. 49.

Collectors have generally regarded this shell as the *Sandvicensis* of authors, an obscure species solely founded on a wretched figure in Walker's "Testacea" that bears a general though rude likeness to the *Odostomia* we are proposing to describe. "The fry," observes Mr. Jeffreys in his interesting monograph of the British members of this little studied genus, "is I believe the *Helix resupinata* of Montagu (p. 444) from Walker's figure 24."

It is rather thin, shining, semi-transparent, and snow-white: the shape ranges from oval-subglobose to globose-conic. The surface may either be termed spirally sulcated, or closely encircled with depressed costellæ; there are often, too, a few scattered but strongly marked wrinkles of increase. Exclusive of the sub-mammillary heterostrophe nucleus, there are not quite three volutions, the last of which occupies at least three-fifths of the entire length. They are of rapid growth, are very profoundly divided by an oblique suture, and assume a rounded off subscalar appearance from being abruptly tumid above and comparatively straighter below. The basal declination of the body, which is neither swollen in the middle, nor angulated at its periphery, is convex. The large and projecting mouth is decidedly longer than the spire; it is of an oval figure that is slightly and abruptly contracted above by the ventricose base of the preceding turn; below it is rounded and a little disposed to spread. The throat merely exhibits the spiral lines of the external sculpture. The outer lip is simple and acute; it abruptly projects at the top, is arcuated below, and is merely convex in the middle. The thickish appressed and broadly reflected pillar lip, which is furnished with rather a large but remote fold, has only a slight curvature, and is much elongated, extending over three-fifths at least of the inner lip. There is no decided perforation, but only a slight umbilical crevice. The length of the shell is not quite a line, and the breadth is from one-third to one-fourth less.

The animal has not been observed.

The species is of extreme rarity, and has only been obtained chiefly, if not entirely, from shell-sand at Scarborough, Sandwich, Exmouth, Burrow Island, Swansea, Tenby, and the west coast of Scotland. (Jeff. Ann. Nat. Hist.).

O. DECUSSATA, Montagu.

With numerous raised spiral lines in the intervals of the longitudinal ribs: whorls more or less rounded, of quick longitudinal increase: fold obsolete.

Plate XCVII. fig. 6, 7.

Turbo pellucidus, ADAMS, Trans. Linn. Soc. vol. iii. pl. 13, f. 33, 34?
„ *decussatus*, MONT. Test. Brit. p. 322, pl. 12, f. 4.—TURT. Conch. Diction. p. 210.—FLEMING, Brit. Animals, p. 299.—Brit. Marine Conch. p. 169.
Helix arenaria, MATON and RACK. Trans. Lin. Soc. vol. viii. p. 214.
Turbo arenarius, (not of Turton) DILLW. Recent Shells, vol. ii. p. 839.—WOOD, Index Testac. pl. 31, f. 54.
Rissoa arenaria, BROWN, Illust. Conch. G. B., p. 12, pl. 9, f. 12.
Odostomia pellucida, JEFFREYS, Ann. Nat. Hist. new series, vol. ii. p. 344.

The identity of this species with the *T. pellucidus* of Adams is too conjectural to hazard a substitution of his name for the more appropriate one bestowed by Montagu. The shell has a narrow oblong shape, and tapers to an obliquely set and bluntish apex; it is moderately strong, not very transparent, a little glossy, and of an uniform white. The principal or lower volutions are adorned with very numerous longitudinal pliciform riblets, that are closely decussated throughout by elevated spiral lines; the former, which extend from the top to the bottom of each whorl, vary as to proximity in different individuals; the latter, which are often obscure beneath the sutures, are chiefly apparent in the intervals of the costellæ. The spire is composed of four convex (or at times even ventricose) turns, that are decidedly narrower above than below, are of quick longitudinal increase, and are very profoundly divided from each other at their oblique and subcanaliculated suture: they are sometimes subscalar, in which case the whorls are flatter than usual. The body, which is quite as long as the rest of the whorls united, is generally convexly subcylindraceous, and more rarely subventricose; the base is a little attenuated and slightly produced, its declination is convex, and rather gradual. The mouth, which occupies about two-fifths of the entire length, is elongated, and oval-acute; it is gradually contracted above by the scarcely convex base of the preceding turn, which forms an obliquely subrectilinear almost continuous line with the columella. The outer lip is simple, acute, and not dilated; it is never much arcuated nor projecting, more frequently, indeed, it is straightish posteriorly. The pillar lip is very narrow, and is not furnished with any distinct fold, though occasionally (yet rarely) a rudimentary one is just perceptible. There is no umbilical crevice. The length of the shell is scarcely a line and a half; the basal diameter rather exceeds the twentieth of an inch.

This is a rare and local species, to which Mr. Jeffreys assigns the following localities: Sandwich, Exmouth, Salcombe Bay, Pembrokeshire, Bantry and Dublin Bays, Arran Isle in Galway; Oban, and west coast of Scotland; Lerwick Sound, and five miles east of Lerwick, in forty fathoms. (Ann. Nat. Hist.).

O. EXCAVATA, Philippi.

Turreted; whorls flattish, scalar, clathrated throughout by remote longitudinal and spiral costellæ, of which last there are four on the body, two of which are continued on the smaller turns.

Plate XCVII. fig. 3, 4.

Rissoa excavata, PHILIPPI, Moll. Sicil. vol. i. p. 154, pl. 10, f. 6.
„ *Harveyi*, THOMPSON, Ann. Nat. Hist. vol. v. p. 97, pl. 2, f. 11.
„ *Deshayesiana*, RECLUZ, Revue Zool. Cuvier. 1843, p. 105?
Cingula Harveyi, Brit. Marine Conch. p. 184.
Parthenia turrita, Index to Brit. Marine Conch. p. xliv. f. 91.
Odostomia pupa, SEARLES WOOD, Crag Moll. vol. i. p. 86, pl. 9, f. 5 (fossil).
„ *excavata*, JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 345.

Although Philippi ascribes but twelve ribs to his *R. excavata*, whilst about half as many again are found on certain individuals of our British species, the coincidence of all the other characters is so precise that we cannot but regard the two shells as identical. This shell is of a slightly transparent uniform white hue, is more or less strong, and has a shortened turreted figure. Numerous slender but rather distant longitudinal costellæ, which are very prominent and nearly perpendicular, continue quite down to the anterior termination of the shell. These upon the superior volutions are crossed by an equally prominent spiral costella rather below the middle of the whorl, and by a less distinct one just at the top; two additional ones encircle the body, one of them on a level with the junction of the outer lip, the other about as far below the last mentioned as that is distant from the preceding one. There are six whorls, which enlarge rather quickly than otherwise, but by no means rapidly, are rather high (generally the length is only one-third less than the breadth), are scalariform above, flattish or even retuse in the middle, and abruptly shelving below: the body, if viewed dorsally, occupies one-third of the entire length; if viewed ventrally, scarcely exceeds the spire; the apex is obtuse; the suture but little oblique. The base is short and its surface flattish; there is no perforation, but often a slight chink. The mouth occupies more than one-fourth of the entire length of the shell, and half the breadth at the base; it is subovate, but squarish above, and rather effuse below: owing to the concave outline of the inner lip, which is reflected, but not appressed, the pillar occasionally exhibits at its commencement a tooth-like projection, which is much more developed in some examples than in others. A fine individual occasionally measures two lines in length and three-fourths of a line in breadth.

This rare shell has been found in but few localities. It was first observed in our seas by Professor Harvey, of Dublin, who found it at Miltown Malbay, in the county of Clare. It has been found in the Frith of Clyde, on the shores of Arran, by the Rev. D. Landsborough, and Mr. Bean; and at Arran in Ireland, by Mr. Barlee, who, as well as Mr. Metcalfe, has taken it in Guernsey.

It was discovered by Philippi on the coasts of Sicily. Under the name of *Odostomia pupa* it has been recorded by Searles Wood from the coralline crag of Sutton.

As the apical whorls of the only existing type of the *Turbo pallidus* of Montagu have unfortunately been broken off, we are only able to conjecture from analogy (the pliciform twist of its columella, as in *insculpta*, to which species, indeed, it bears much resemblance, but has a greatly more elongated spire) that it may belong to this genus. The specimen in our national museum is not in such condition, that, although we have failed in identifying it, we can positively assert its individual distinctiveness from any of the species we have described — yet since much uncertainty has always existed as to what Montagu really intended, we have held it desirable to carefully describe and delineate the example.

O? PALLIDA, Montagu.

Oblong-turreted, regularly tapering; whorls flattish, devoid of longitudinal sculpture; spire twice as long as the mouth; no tooth.

Plate XCVIII. fig. 4.

Turbo pallidus, MONT. Test. Brit. vol. ii. p. 325; Suppl. p. 133, pl. 21, f. 4.
Voluta ambigua, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 132.—DILLW. Recent Shells, vol. i. p. 510.—WOOD, Index Testac. pl. 19, f. 28.
Phasianella pallida, FLEMING, Brit. Animals, p. 302.
Cingula „ Brit. Marine Conch. p. 185.
Rissoa „ BROWN, Ill. Conch. G. B. p. 13, pl. 8, f. 24.

The authors we have quoted have derived their whole knowledge of the species from the individual described in the " Testacea Britannica." The specimen, when perfect, had an oblong-turreted figure, and was composed of six or seven moderately tapering fragile whorls, of which only about the four-and-a-half larger ones now remain.

They are moderately tapering, very little convex, of gradual longitudinal increase, very slightly more rounded below, somewhat planulate beneath the oblique and canaliculated suture. The dull white surface is almost smooth, yet traces exist of what we imagine to have been spiral striæ, and there seems an impressed line (perhaps accidental) below the suture of some of the smaller turns likewise. The body would not apparently compose more than two-fifths, at most, of the total length of the perfect shell; it is well rounded at its periphery, and declines below with a gradual and decidedly convex slope. The mouth would probably occupy one-third of the entire length; it is of a rather produced and peaked subovate form, is regularly contracted above to a very acute angle, and is somewhat narrowly rounded below, where it is a little disposed to expand. The outer lip, which advances at the base, is simple, acute, and somewhat arched, but much more so below than above; owing to the comparative straightness of the columella, which is still, however, a little curved, its union with it forms a blunt or rounded-off rectangle. There is a peculiar inward twist, but no apparent fold, at the origin (or posterior end) of the pillar lip; this last forms only one-half of the inner lip (the upper portion of which is convex) and is erect and peculiarly narrow, but eventually becomes a very little reflected. There is no true axial perforation, but only an indentation of the surface behind the pillar lip. Montagu obtained the specimen from sand in Salcombe Bay, South Devon, and states that the breadth is scarcely one-third of the length which latter is fully the eighth of an inch.

Note.—We have never met with the following shell, but judging from its figure it must be distinct from any we have noticed. It is stated to have been picked up by the author from the beach near Montrose.

O. (*Jaminia*) *pullus*, Brown, Ill. Conch. G. B. p. 22, pl. 9, f. 11. "Subconic; with six slightly rounded volutions, terminating in an obtuse apex; the whole shell invested by five flat spiral ribs; aperture subovate, slightly contracted above; outer lip plain; columella furnished with a sharp tooth-like process near its centre; whole shell of a pale flesh-colour, and not glossy."

EULIMELLA. Forbes.

Shell elongated, of many whorls, solid, smooth, and polished. Apex of the spire with a persistent embryonic sinistral shell. Aperture subquadrate, peristome incomplete, columella not plicated, straight or nearly so. Operculum corneous, pyriform.

Animal resembling in all its characters that of *Chem-*

E. Scillæ, Scacchi.

Subulate, not very slender, not truly perforated; whorls nine or ten, short, flattened; body about one-fourth of the total length, more or less angular at the periphery; mouth not much more than a fifth of the ventral length, subquadrate.

Plate XCVIII. fig. 5, 6, and (Animal) Plate F. F. fig. 7.

Eulima crassula, Jeffreys, Malac. and Conch. Mag. pt. 1, p. 34 (no description).
„ *Scillæ*, Philippi, Moll. Sicil. vol. ii. p. 135, pl. 24, f. 6 (as of Scacchi).
„ *M'Andræi*, Forbes, Ann. Nat. Hist. vol. xiv. p. 412, pl. 10, f. 2.
Turbonilla Scillæ, Lovén, Index Moll. Scandin. p. 18 (from specimens).
Eulimella crassula, Jeffreys, Ann. Nat. Hist. vol. xix. p. 311 (a name only).
Odostomia Scillæ, Jeffreys, Ann. Nat. Hist. new ser. vol. ii. p. 349 (no description).
Chemnitzia M'Andræi, Alder, Moll. Northumb. and Durh. p. 50.

The shell is of a rather slender turreted shape, not particularly thin, perfectly smooth, very slightly translucent, and of an uniform polished porcelain white. Its spire, which tapers to a rather obtuse point, is composed of about nine volutions besides the heterostrophe apex, and is divided by a profound and scarcely slanting suture. The whorls, whose longitudinal increase is rather slow, are short (that is to say, only about half as high as they are broad), and, except one or two of the earlier ones, so flattened that their slant is almost uninterrupted throughout the shell: nevertheless, a slight swell is occasionally apparent near the base of the last turn or two. The body, which occupies about a quarter of the length of the shell, and is about equal in length and breadth, is subangulated at the commencement of its extremely abrupt, yet convex, basal declination. The mouth does not much exceed a fifth of the total length, and is destitute of any sculpture whatsoever. It is acutely contracted posteriorly, but its general shape is subquadrate, as the long and straight pillar forms rather more than a right angle with the convex but almost horizontal base of the penult turn, and almost a rectangle, likewise, with the abruptly arcuated base of the outer lip. This last is simple, acute, straight above, and neither expanded nor laterally projecting; it advances at the anterior extremity. There is no real umbilicus, yet owing to the reflection of the pillar lip there is often an appearance of a very minute axial perforation. Our examples, which are three-eighths of an inch long, measure about the ninth of an inch across at the base.

The animal is entirely white; its tentacula are lanceolate and auriform, often folding in their sides so as to appear oblongo-quadrate with truncated or even emarginated tips; their bases are set well apart, and the eyes are seen closely approximated at their inner angles, small, black, each placed on the side of a small dusky spot at the anterior extremity of an oval opaque white space. The mentum is narrow and strongly bilobed in front; the foot is oblong, truncate in front, and rather acutely angled; gently pointed behind.

This beautiful shell is one of the most elegant of the many rarities which inhabit the Hebrides, where it was first found by Mr. Jeffreys, and afterwards by Mr. M'Andrew. It occurs throughout the Clyde district, the inner and outer Hebrides, and the Zetland Isles, and has lately been dredged by the indefatigable naturalists of Northumberland at Whitburn on this coast. A few of the Scottish localities will serve to show its range in depth: in thirty and fifty fathoms, Loch Fyne; in twenty fathoms sand, Lismore; in twenty-five fathoms, mud, Sound of Skye; in thirty fathoms, off Croulin Island, sandy mud; in thirty-four fathoms, Elgin; in eighty and ninety fathoms on sand, Zetland.

Professor Lovén finds it in the Scandinavian seas.

E. ACICULA, Philippi ?

Very slenderly subulate, almost aciculate, imperforated ; whorls eight or nine, almost flattened ; spire four times as long as the body ; apex fine.

Plate XCVIII. fig. 9, 10.

Melania acicula, PHILIPPI, Moll. Sicil. vol. i. p. 158, pl. 9, f. 6 ?
Eulima „ PHILIPPI, Moll. Sicil. vol. ii. p. 135 ?
Eulimella clavula, JEFFREYS, Ann. Nat. Hist. vol. xx. (1847), p. 17.
Chemnitzia acicula, ALDER, Moll. Northumb. and Durh. p. 49.
Odostomia „ JEFFREYS, Ann. Nat. Hist. new ser. vol. ii. p. 349.

We do not feel assured that this is the species intended by Philippi, but are contented to abide by the supposed identification in default of evidence to the contrary. The British shell is very slenderly subulate, rather thin, slightly translucent, of an uniform polished white, and smooth to the eye ; yet under a powerful lens most densely disposed microscopic spiral striulæ may occasionally be perceived, and obsolete irregular longitudinal wrinkles are dimly apparent. The spire, which is nearly four times as long as the body, and slowly tapers to a tolerably fine exserted apex, is composed of about seven volutions (besides the heterostrophe apical coil) which are of decidedly slow longitudinal increase, and of moderate height (that is to say, in the penult turn the breadth does not exceed the length by much more than one-half the latter) ; they overlap each other rather broadly and shelve from top to bottom in a gently convex line, yet usually incline inwards a little at their base. The suture is profound, and a little slanting. The basal declination of the body, which occupies only a fifth of the entire length, is moderately rounded, and is neither abrupt nor at all angulated at the commencement. The aperture, which is throughout devoid of sculpture, scarcely occupies a fifth of the total length, is of a suboval or subrhombic-oval shape, moderately contracted above, and rather narrowly rounded and sometimes a little produced below.

The nearly straight and elongated pillar (which, nevertheless, is slightly tortuous) forms an obtuse angle with the moderately slanting and somewhat convex base of the penult turn. The outer lip is simple, acute, a little arched, and neither expanded nor prominent. The pillar lip is reflected, and though narrow not particularly so. The axis is imperforate. An ordinary sized individual measured the sixth of an inch in length, and half a line across at the base; the one we have figured is rather larger.

It is a rare and deep water shell. The following localities are attributed to it in Mr. Jeffreys' Monograph—Dartmouth, Exmouth, Torquay, and Burrow Island in South Devon; Whitburn; Tenby; Birterbuy Bay and Arran Isle in Galway; Bantry Bay; Loch Fyne, and other parts of the West of Scotland; Zetland, five miles east of Lerwick in forty fathoms water.

A variety is taken at Plymouth, the Scilly Isles, and Stornaway which is shorter and more solid than the typical form; its whorls are quite planulate, consequently the upper portion of the outer lip is straight, as in the preceding shell, to which, indeed, it approaches so closely in character that were it not for its more slender shape, and less peculiarly short volutions, we should have been tempted to annex it to that species.

The more conical form of *Scillæ*, its remarkably short volutions, the more abrupt basal declination of its body-whorl, and its straighter and shorter columella seem the more striking distinctive features of that larger species.

E. AFFINIS, Philippi.

Slenderly subulate, thin, transparent, imperforate ; whorls eight or nine, more or less rounded ; mouth only a fourth or a fifth of the entire length ; apex fine and exserted : basal declination much rounded.

Plate XCVIII. fig. 7.

Eulima affinis, PHILIPPI, Moll. Sicil. vol. ii. p. 135, pl. 24, f. 7 (fossil).
Pyramis lævis, BROWN, Ill. Conch. G. B. p. 14, pl. 9, f. 51, 52 ?
Eulimella gracilis, JEFFREYS, Ann. Nat. Hist. vol. xix. p. 311.
Odostomia affinis, JEFFREYS, Ann. Nat. Hist. (new ser.) vol. ii. p. 350.

The identification of the smaller recent species with their supposed fossil analogues, without the direct comparison of typical examples, must ever be attended with some degree of uncertainty. The great attention bestowed by Mr. Jeffreys on the members of this genus induces us to follow his identification.

The shell is of a shining white, thin, semitransparent, quite smooth, and of a slenderly subulate form. The spire, which is often arcuated, is usually quadruple the length of the body, and composed of seven ventricose volutions, besides the fine and exserted heterostrophe apical coil. The whorls, which are deeply divided by a simple sutural line, are moderately high (at least the penult is, its length being to its breadth as three to five), and of rather slow longitudinal increase. The body, which is nearly as broad as it is long, is well rounded, especially at its basal declination ; there is no vestige of an axial perforation. The mouth is devoid of sculpture, and fills a fourth or a fifth only (the latter in the adult) of the ventral length ; its form is subovate, but is rather abruptly contracted by the swell of the penult turn above, below it is rounded, but not broadly so. The outer lip is simple, acute, convex posteriorly, arcuated anteriorly. The columella forms a distinct obtuse angle with the upper portion of the inner lip; although nearly perpendicular it is a little twisted; the reflection of the pillar lip is very trifling. Fine examples scarcely measure a quarter of an inch in length; their breadth is four times less.

In this species the upper edge of each whorl overlaps but slightly the base of the preceding one.

This elegant little shell has been dredged by Mr. Barlee in Skye, Oban, Loch Fyne, and Guernsey. It must be regarded, at present, as a very rare species.

E. clavula, Lovén (?)

Small, short, little tapering; whorls plano-convex; suture well marked, the lowest one dividing the ventral surface into two equal parts; apex very blunt and depressed: axis distinctly perforated.

Plate XCVIII. fig. 8.

Turbonilla clavula, Lovén, Index Moll. Scandinav. p. 18; Översight Vetensk. Akad. Förhandl. 1846, p. 49, pl. 1, f. 7.
Odostomia „ Jeffreys, Ann. Nat. Hist. (new ser.) vol. ii. p. 349.

This rare British shell, which Mr. Jeffreys, after the examination of a typical example of the *T. clavula* of Lovén, has pronounced to be identical with it, agrees fairly enough with the few characters specified in the three lines of its description. Our authority for the name, then, is rather that identification, than any certainty derived from the accordance of the shell with its brief diagnosis. It is of a very short turreted shape, tapers slowly to a very blunt apex, is entirely snow white, polished, quite smooth, and not absolutely opaque. Exclusive of the depressed heterostrophe apical coil there are four-and-a-half or five volutions, which are of moderate or rather slow longitudinal increase, rather short than otherwise, and plano-convex. The suture, though simple, is very distinct, and a little slanting; above it the surface is usually more convex, below it generally more planulate. The basal declination is rounded and gradual. The axis of the shell is distinctly perforated. The aperture, which is devoid of sculpture, occupies one-third of the entire length; it is of a subpyriform oval shape, being rounded, though not broadly so below, and rather abruptly contracted above. The acute and simple outer lip neither expands nor projects, it is decidedly straight at first, but becomes a little curved anteriorly where it joins the columella without angulation. The pillar lip is straight and thin above, a little reflected and curved below; it forms a very obtuse angle with the convex and moderately slanting base of the preceding turn. None of our specimens are more than the tenth of an inch long, and scarcely measure half a line across; we suspect, however, that these will by no means prove the limits of its growth when the species becomes better known.

At present the very few examples that have been taken were dredged within a few yards of the shore (at low water) near Brixham in Torbay, by Dr. Battersby and Mr. Hanley, from a bottom at some six or seven fathoms depth. Although taken alive, the animals were unfortunately dried up before the shells were observed and selected from the mass of dredged matter; hence we can at present give no account of the mollusk from our own observation. Professor Lovén, however, has described and figured the animal of his *clavula* as having broad short tentacula which are united at their bases, somewhat swollen out at their lower parts, and having the eyes rather distantly placed near their inner bases. The mentum is stated to be rounded and bilobed. Judging from the delineation we should imagine the figured example to be immature.

The true position of the two following genera is doubtful. Both appear to have relations, possibly only of analogy, with *Conovulus*. In *Truncatella* both animal and shell have many important points of resemblance with *Chemnitzia* and its allies, though, at the same time, there is an apparent affinity with *Rissoa*. In *Otina*, we have a shell approaching that of *Natica*, and scarcely distinguishable from that of *Velutina*, whilst the animal is very distinct from either, and has, it seems to us, a near connection with *Truncatella*. The curious *Rissoa*-like shells placed by Philippi in the last-named genus, and constituted by Pfeiffer into a distinct group, under the name of *Paludinellæ*, may constitute a link between them.

TRUNCATELLA, Risso.

Shell turreted, apex dextral, deciduous; lower and persistent portion cylindrical; surface usually plicated longitudinally. Aperture ovate, entire; operculum corneous, simple, not spiral.

Animal with short diverging triangular tentacula, the eyes placed centrally at their upper bases. Head bilobed, more or less muzzle-shaped. Foot short, rounded at both ends.

This genus was constituted to receive certain shells included by Draparnaud in *Cyclostoma*. Its animal has been carefully examined by Lowe and by Philippi. Almost all the species are tropical or subtropical. They live upon the very verge of the sea, under stones or weeds near high water-mark.

T. Montagui, Lowe.

Plate XCIX. fig. 1, and (Animal) Plate FF. fig. 10.

Helix subcylindrica, Linn. Syst. Nat. ed. 12, p. 1248 (from type).—Pulteney, Hutchins, Hist. Dorset, p. 49.

Turbo truncatus, Mont. Test. Brit. vol. ii. p. 300, pl. 10, f. 7.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 177.—Rack. Dorset Catalog. p. 51, pl. 19, f. 8.—Turt. Conch. Diction. p. 218.

,, *subtruncatus* (Young), Mont. Test. Brit. p. 300, pl. 10, f. 1.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 178.—Turt. Conch. Diction. p. 218.

Turritella truncata and *subtruncata,* Fleming, Brit. Animals, p. 303.

Cyclostoma truncatulum, Jeffreys, Trans. Linn. Soc. vol. xvi p. 363.

Truncatella Montagui, Lowe, Zoolog. Journ. vol. v. p. 303.—Brit. Marine Conch. p. 146, f. 75.—Reeve, Conch. Systemat. vol. ii. pl. 182, f. 1.—Pfeiff. Zeitschr. Malak. 1846, p. 185.

Rissoa truncata, Macgilliv. Moll. Aberdeen. p. 152.

Eulima nitidissima, Macgilliv. Moll. Aberd. p. 142 (Young, teste Jeffreys, from types).

Where a species is so inadequately defined, as to render its identification a matter of conjecture, we think it fair to prefer the name of that author who first clearly indicated its specific character. On this principle, we have rejected the epithet *subcylindrica*, and as Montagu's appellation is perhaps somewhat objectionable, being indicative of a generic, and not a specific peculiarity, we accept for him, as an equivalent honour, the substitute offered by Lowe. Whether the shell is more than an aberrant variety of the *Cyclostoma truncatulum* of Draparnaud (whose variety γ, pl. 1, f. 31, looks very like it), we feel by no means assured, but defer to the judgment of that distinguished Conchologist (Pfeiffer), who has published a recent monograph of the genus.

The curious truncation of the apical whorls which occurs in adult examples of this very local shell, induced Montagu to regard it as a different species from its turreted young.

When adult, the shell is almost cylindrical, more or less narrow, rather thin, a little translucent, and of an uniform shining, pale-reddish, tawny hue. Beneath the suture the surface is longitudinally crenated with very numerous and short narrow folds, and the bases of the turns are oftentimes corrugated, likewise, by a similar but less manifest sculpture; elsewhere the shell is smooth, or very nearly so, and occasionally in the adult, and nearly always in the young, the markings are almost entirely absent. In the immediate vicinity of the outer lip the wrinkles extend right across the body. This last, whose base is well rounded, and whose declination is early, gradual, and decidedly convex, is about a third shorter than the united three whorls, that alone, in that state of growth, remain of the spire. These turns are rather high, almost equally as broad above as below, and although swelling out more or less (and often abruptly) from each suture, cannot well be termed ventricose, being somewhat flattened in the middle: the suture which divides them from each other is rather oblique, and though simple, very profound. The mouth, which is not adorned with any sculpture, is very short, merely occupying about two-sevenths of the total length; it has a greater or lesser lateral projection, and a subovate contour, and is not angularly contracted above, though less broad than at its rounded base. The peristome is complete, and the enamel is very broadly spread upon the upper part of the inner lip, from whence it diminishes in breadth anteriorly. The outer lip is convex, and either thickened or slightly disposed to expand; there is no peculiar advance nor marked basal retrocession of its margin. The columella does not form any angle (as in *Chemnitzia*) with the upper portion of the inner lip, but runs in the same obliquely subrectilinear line with it. The axis is not perforated.

The form in the young shell is tapering subcylindraceous, and the apex is not truncated, but only very blunt. The spire, previous to its decollation, consists of six volutions, which are even more deeply and abruptly divided than in the adult specimens; the outer lip is acute and simple.

The majority of our English examples (what we have from the Adriatic are larger and less deeply divided) do not measure more than two lines and a third in length, with a breadth of scarcely more than a third of that measurement.

The animal is of a yellowish white colour

An influx of fresh water seems essential to its existence. It is obtained near Portland, and at Wyke, near Weymouth, cast up dead at high water-mark (S. H.); at Poole (Rackett); and also said to be picked up here and there on the shore of South Devon, and at Southampton in brackish water. Macgillivray states that it has been taken in sea-sand from the Bay of Cruden, and Mr. Bean enumerates it among the species taken at Scarborough (could these examples have been transplanted in ballast? for it is mainly a southern shell).*

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* Pulteney, who first introduced the species into the British Fauna, appears to have sent Montagu an exotic shell, which he regarded as identical with the Dorset species. The author of the "Testacea Britannica" described the latter in his work under the name of *Helix subcylindrica* (p. 393,—*Cyclostoma subcylindricum*, Fleming, Brit. Anim. p. 258, probably), but expressed his doubts of its indigenousness, stating it to be a common West Indian species (perhaps the *Tr. Caribæensis* of Pfeiffer's Monograph). It is, however, generally supposed to be the *Tr. (Cyclostoma) truncatula* of Draparnaud, a Mediterranean shell,

Mr. Thompson records it as having occurred among shells gathered by Mrs. Hancock at Bundoran on the coast of Donegal. It is a South-European species.

OTINA.

Shell ovate, of few whorls, the first very large and ventricose, those of the spire very small; aperture large, oblong, entire. No operculum.

Animal bulky; tentacles nearly obsolete, eyes sessile on the large obtuse head; mantle not reflected, simple-edged; foot very large, oblong, rounded at both ends; an armed tongue and jaws; branchial plume single?

The type of OTINA (indicated, but not described, by Gray), is the *Velutina otis* of British conchologists. There can be no question of the propriety of constituting a distinct genus for this curious mollusk, although the shell alone would scarcely warrant such a rank. We adopt the appellation proposed by Mr. Gray, at the same time entering our protest against the practice of publishing generic names without definitions, or at least a clear statement of reasons for constituting the genus; in no cases can such a name have any authority or priority, until a definition be published. The proceeding is mischievous, and liable to great abuse, since it implies neither knowledge nor research on the part of the offender. In this particular instance the name appears in Mr. Gray's list of genera. It occurs in the form apparently of a sub-genus of *Velu-*

which we are not aware has been found in the Antilles. The *Pyramis truncatus* of Brown (Ill. Conch. G. B., p. 15, pl. 8, f. 31), said to have its entire surface covered with strong longitudinal striæ, is, perhaps, this spurious species; the description of it in other respects agrees fairly enough with the British one. The figure given in the same work (pl. 9, f. 49, 50) of the *Pyramis subtruncatus* is certainly not the *Turbo subtruncatus* of Montagu, but the rudeness of the drawing prevents our determining what it is designed for.

tina, and in the family of *Velutinidæ*. The position thus assigned to it is sufficient to show that the distinguished enumerator had no knowledge of its true affinities or of the character of its animal, consequently we can regard the generic rank assumed by it in that list as adopted on a mere guess.

O. otis, Turton.

Plate XCIX., fig. 2, 3, and (animal) Plate O O. fig. 4.

Helix otis, TURTON, Conch. Diction. p. 70.
Velutina otis, FLEMING, Brit. Anim. p. 324.—FORBES, Malac. Monens. p. 29, animal.—Brit. Marine Conch. p. 153, f. 4.
Galericulum ovatum, BROWN, Ill. Conch. G. B., p. 23, pl. 19, f. 27, 28, magnified.
,, *otis*, BROWN, Ill. Conch. G. B. p. 24.
Velutina ? ,, ALDER, Cat. Moll. Northum. and Durh. p. 69.

The figure of this interesting little shell is intermediate between that of *Lamellaria perspicua* and *Lacuna pallidula ;* it reminds one a little of the genus *Navicella*. It is minute, rather thin (hence a little transparent), and beneath the purplish-brown closely adhering skin, with which it is covered, of an uniform glossy brown ; its surface is almost smooth, being merely wrinkled in a spiral direction with most densely disposed microscopic lines. The spire, examined from the dorsal side, seems only a little globule of one coil, that is placed so laterally (being, too, extremely narrow, scarcely exceeding, on the average, the tenth part of the body in breadth) as almost to be confined to the left side of the shell ; though abruptly prominent, it is scarcely elevated above the level of the outer lip. When resting on its mouth, the shell seems much depressed, yet the surface of the whorls is very convex. The body swells out rather abruptly from the simple suture, it is peculiarly produced (in the adult) towards the lower right-hand corner, hence the appearance of obliquity which it presents; the final declination is abrupt but well rounded. The capacious aperture fills nearly the whole of the ventral area, yet does not disclose the internal gyration. The peristome is complete, and of a rounded oval figure, of which the pillar end, however, is blunted. The acute and simple outer lip is much produced, disposed to expand, aud everywhere arcuated; the throat is quite smooth, and much shining. The pillar lip is flattened, shelves inwards, and is devoid of sculpture or canal; it is of a narrow sublunar shape, the incurvation of it is very trifling above. There is no vestige of any umbilicus. Such is the minuteness of its size, that our largest example only measured the ninth of an inch across.

We found *Otina otis* alive many years ago in crevices of rocks between tide-marks, associated with *Kellia rubra* and *Conovulus albus* at Kirk Santon Head, in the Isle of Man. We were at once struck by its dissimilarity from *Velutina*, by its horn-less head, and its curious *Succinea*-like aspect. Since then we have never had an opportunity of examining it, but are enabled from the published notice by Mr. Alder, and from more extended valuable notes communicated by Mr. Clark, to detail its characters. The animal is of a hyaline white hue, very thick and large as compared with the size of its shell. The mantle is simple and not reflected on the shell. The head is large and broad, and bears two almost obsolete triangular tentacles or auricular processes. The eyes are set at the upper bases of these; they are large and black. The mouth is inferior and vertically cloven; it is furnished with distinct jaws and a short denticulated tongue. The foot is oblong, divided by a transverse groove across its centre, and furnished with a creeping disk at each end, so that the creature marches in the manner of *Pedipes* and *Truncatella*. (The *Chemnitziæ* have a very similar method of progression.) The branchial plume appears to lie across the head under the centre of the mantle.

We regard it as a very local shell, though tolerably abundant when found at all. It is a strictly littoral species, inhabiting the chinks of rocks between tide-marks, where it is usually taken in the empty cells of barnacles (*Balani*) or attached to the common mussel. Mr. Clark remarks that like the *Littorinæ* it is often uncovered by the sea, for eighteen hours out of the twenty-four. It is chiefly found on the western and south-western coasts, and the rocky shores of the Irish Sea. Mr. Jeffreys finds it in South Wales; Mr. Clark in S. Devon; Mr. Couch and Mr. Peach in Cornwall; Mr. Barlee in the Channel Isles. On the east coast of England it has been observed in Northumberland by Mr. Alder, and at Scarborough by Mr. Bean. Mr. W. Thompson enumerates it among the shells of the west coast of Ireland. Birterbuy Bay, Galway (Barlee); Clare (Humphreys).

It does not appear to have been noticed by continental conchologists.

NATICIDÆ.

In this family we have an assemblage of Gasteropoda presenting very peculiar and marked characters. The shell is spiral and more or less globular or expanded, usually smooth and polished. Its general aspect resembles that of *Nerita*, so that for a long time these two very dissimilar mollusks, so far as essential characters of organization go, were placed in one family and originally in one genus. The animal of the *Naticidæ* has, however, a retractile proboscis, and is remarkable for the great development of the fold or mentum on the upper and anterior portion of the foot, which becomes in it a great lobe reflexed upon and protecting the head. The operculigerous lobe is also remarkably developed and reflected upon the shell. The tongue is furnished with teeth. The *Naticidæ* appear to be of exceedingly predacious habits. They are chiefly inhabitants of the laminarian and coralline zones. There are numerous and beautiful forms of the tribe in tropical seas.

From the earliest geological epochs there appears to have been well marked members of this family inhabiting the area of the British seas. Some of these, even among the most ancient, bear a striking resemblance to existing species, but, not until the later tertiary epochs do we find British *Naticidæ* identical with those now living.

NATICA, Brugiere.

Shell more or less globular, usually strong, with a short spire of few volutions; surface usually smooth or very finely striated; often polished; aperture ovato-pyriform, outer lip acutely edged; inner lip more or less expanded or callous, encroaching on and sometimes concealing the umbilicus. Operculum corneous or calcareous, elliptical, with a small spire.

Animal very large in proportion to the shell, but always perfectly retractile. Head small, furnished with a long trunk, and surrounded by a tentacular veil, from which two lanceolate tentacles, set well apart, spring; eyes usually absent, when present very minute, and placed beneath the tentacular veil; foot very large and expanded, rounded at both ends; mentum greatly developed, forming a large oblong disk in front of the shell, the anterior portion covering the foot, the posterior reflexed upon the head and tentacula, so that the tips only of the latter appear above it when the animal is walking. Operculigerous lobe very ample, reflexed upon and partially concealing the shell both at the sides and back: jaws distinct, corneous; tongue short, linear, each row of teeth upon it consisting of a quadrate, broad based median tooth with a denticulated apex, flanked by three uncini on each side; male organ falcate; branchial plume single.

The spawn of *Natica* is deposited in the form of a subspiral or concentric ribband or strap, rendered firm by agglutinated sand.

The species of this genus inhabit every climate, but are most numerous in warm regions. Some of them, as the *Natica hercules* from Oregon, grow to a large size.

N. monilifera, Lamarck.

Large, subglobose, with a single band of coloured streaks below the suture; whorls abruptly ventricose; outer lip arching out from the body at almost a right angle; umbilicus open, impressed with faint spiral grooves.

Plate C. fig. 1, and (animal) Plate P P. fig. 6, (by mistake as *N. canrena*).

Lister, Anim. Angl. pl. 3, f. 10; Hist. Conch. pl. 568, f. 19. —Geve, Conch. pl. 28, f. 317.

Nerita glaucina, (not of Linn.) Pennant, Brit. Zool. ed. 4, vol. iv. p. 140, pl. 87, f. 141.—Pulteney, Hutchins, Hist. Dorset, p. 50.—Donov. Brit. Shells, vol. i. pl. 20, f. 1.—Mont. Test. Brit. vol. ii. p. 469 (adult).—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 224 (in part only).—Rack. Dorset Catalog. p. 57, pl. 21, f. 7 (larger form).—Turt. Conch. Diction. p. 124 (not var.), f. 71, 72 (as *canrena*).—Dillw. Recent Shells, vol. ii. p. 978.—Wood, Index Testaceolog. pl. 35, f. 5.

,, *catena*, Da Costa, Brit. Shells, p. 83, pl. 5, f. 7 (not young).

Natica monilifera, Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 638.—Forbes, Malac. Monens. p. 29.—Johnston, Berwick. Club, vol. i. p. 265, with animal.—Macgilliv. Moll. Aberd. p. 125, and animal, p. 346.—Brit. Marine Conch. p. 147.—Brown, Illust. Conch. G. B., p. 24, pl. 13, f. 8, 10.—Blainv. Faune Française, Moll. pl. 14, f. 5.—Hanley, Young Conch. p. 55.—Harvey, Sea Side Book, p. 33.

,, *ampullaria*, Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 633; Deles. Rec. Coq. Lam. pl. 32, f. 11? (teste Récluz).

,, *castanea*, Lam. Anim. s. vert. (ed. Desh.) vol. viii. p. 643.—Blainv. Malacol. pl. 36, bis, f. 4.—Deless. Rec. Coq. Lam. pl. 32, f. 15.

,, *glaucina*, Fleming, Brit. Animals, p. 319.

,, *squalida*, Macgilliv. Moll. Aberd. p. 128 (worn, teste Jeffreys, from type); copied, Brown, Illust. Conch., G. B., p. 130.

,, *catena*, Alder, Cat. Moll. Northum. and Durh. p. 68.—Searles Wood, Crag. Moll. vol. i. p. 142, pl. 16, f. 8 (fossil).

Although the name assigned by Da Costa to this and the succeeding species conjointly, is prior to the Lamarckian appellation, we have not retained it, since it was perversely bestowed by that author, in despite of his own erroneous conviction, that the species thus designated, was the *glaucina* of Linnæus.

The shell is not depressed, but nearly globose, and in the adult is about equally as broad as long; it is moderately strong, yet not very solid, more or less glossy, smooth, or nearly so (for there are very many obscure fine wrinkles of increase), and adorned below the junction of the whorls with a single narrow band of obliquely longitudinal flexuous chestnut streaks, on a ground of pale livid flesh, or olivaceous grey, that becomes whiter upon the base, and turns paler, for the most part, in the more aged examples. A very short upper rim of white usually margins the whorls, and renders the strongly pronounced suture more conspicuously distinct. The body is very large, and is much swollen, yet is flattened in some slight degree in the middle; its base is not at all peaked nor produced, and slopes rotundately, but rather abruptly, to its anterior termination. The spire, which occupies nearly two-sevenths of the dorsal length, is composed of five or five and a half quickly tapering short turns, whose volutional increase is rapid but equable, the penult not being strikingly longer than the preceding coil; they are of abrupt elevation (so that they do not appear to shelve into each other as in *Alderi*), are much rounded, and are neither angulated, flattened, nor retuse above, as in certain *Naticæ;* the apex is very small, but not much projecting. The mouth, which is half moon-shaped, or of a very narrow subovate form (being more broadly rounded anteriorly), occupies nearly two-thirds of the ventral length; the throat is smooth, and stained with chestnut or livid brown. The acute and simple outer lip almost forms a semicircle, and arches out from the body at nearly a right angle. The umbilicus is large, open, and rather obscurely and slightly grooved in a spiral direction; it is not environed by any band of colour.

The callus of the inner lip is white, and not peculiarly spread, but rather short than otherwise for the genus; it does not conceal the umbilicus, but on arriving at it, turns abruptly off in nearly a straight line, and rejoins the pillar at rather more than a right angle. The perforation, and consequently the apex of the angle, is just half-way between the top of the outer lip and the extreme base of the aperture. The pillar lip is pure white, solid, slightly reflected, and well rounded anteriorly. The average diameter of specimens is only an inch and a fifth, but examples are said to occur of nearly two inches in length.

Dr. Harvey, in that very interesting little work, his " Sea-side Book," thus graphically describes the nidus of this abundant species. This *Natica*, he observes, " either leaves its egg-cluster loose in sandy places, or attaches it so carelessly, that it frequently becomes loose. These egg-clusters are really very curious and elegantly formed objects, which must often have attracted the notice of a rambler, who felt puzzled to know what they were. They are firmly gelatinous, or of the consistence of gristle; transparent, or nearly so; slightly coated with fine sand, and in shape resemble the hoof of an animal. When dry, they look not unlike pieces of thin Scotch oaten bread. Their surface is marked with little hexagonal spaces, which define the eggs. But what is most to be admired in the structure, is the form of the curves which the hoof-like body assumes, which fit it for lying on loose sand, without becoming deeply buried in it. It is difficult to make this peculiar form understood by mere description, but I have said sufficient to identify the object." This curious mass of eggs was considered to be a

Zoophyte by Ellis, and was characterised as such by Gmelin under the name of *Flustra arenosa.* Its true nature was first surmised by Mr. Boys, and in 1823 Mr. Hogg communicated an interesting paper to the Linnean Society, in which he demonstrated it beyond question to be the nidus of *Natica monilifera.*

The animal is entirely of a yellowish hue, deepening into yellow on the sole of the foot, and more or less tinged with purple above; especially on the anterior portion, which, when contracted, is thickly veined with purplish brown. The foot is very large, and capable of great expansion, rounded in front and behind, and extending far around the shell, which is partially concealed by the reflected mentum and operculigerous lobe, both paler in colour than the rest of the body. The tentacula are long and lanceolate-triangular, white, or tinged with reddish-brown; there are very minute sessile eyes at their external bases beneath. The operculum is corneous. Our figure of the animal is taken from a drawing by Mr. Spence Bate.

Though a common, this is at the same time rather a local species, being found, however, on most parts of our coast where sand is plentiful. It abounds, buried in sand, in many places not far below low-water-mark, and ranges as deep as ten or fifteen fathoms.

It is general throughout the Celtic region of the European seas; and dates its genealogy from later tertiary times. The absence of colour and the decortication of the sutural margins of the whorls in fossil specimens of this genus, render their identification with recent species extremely difficult and obscure.

N. nitida, Donovan.

Of an oblique rounded ovate shape, rarely pure white, usually with five spiral bands of coloured markings on the body-whorl, which is attenuated posteriorly; whorls shelving, as it were, into each other; outer lip united to the body at an acute angle; umbilicus smooth within, environed by a band of colour.

Plate C. fig. 2, 3, 4, and (Animal) Plate P P. fig. 5 (as Alderi).

Lister, Hist. Conch. pl. 561, f. 8?
Cochlea, *No.* 1324, Linn. Fauna Suecica, ed. 1.
Nerita glaucina, Linn. Fauna Suecica (not Syst. Nat. ed. 10 or 12), ed. 2, p. 533. —Mont. Test. Brit. vol. ii. p. 470 (young).—Rack. Dorset Catalog. p. 57, "small ordinary form."—Turt. Conch. Diction. p. 125 (var. B).—Hogg, Trans. Linn. vol. xiv. p. 320, pl. 9, f. 5, 6. — Born, Testacea Mus. Cæs. Vindob. p. 396, pl. 13, f. 20, 21?
„ *catena*, *young*, Da Costa, Brit. Conch. p. 84.
„ *nitida*, Donov. Brit. Shells, vol. iv. pl. 144, copied and enlarged, Brown, Ill. Conch. G. B. p. 13, f. 7, 11?
„ *mammilla*, *var. c.* Dillw. Recent Shells, vol. ii. p. 985 (from Donovan).
Natica nitida, Fleming, Brit. Animals, p. 319.—Forbes, Malac. Monens. p. 62. —Macgill. Moll. Aberdeenshire, p. 127 (variety, teste Jeffreys from type).—Brit. Marine Conch. p. 148.
„ *monilifera*, Forbes, Mag. Nat. Hist. vol. ix. p. 191, f. 2 (animal).
„ *intermedia*, Philippi, Moll. Sicil. vol. i. p. 163, pl. 9, f. 11, changed to *Marochiensis*, p. 156, and vol. ii. p. 140.
„ *castanea*, (not of Lam.) Potiez and Mich. Gal. Douai, Moll. vol. i. p. 293, pl. 28, f. 24, 25.
„ *Alderi*, Forbes, Malac. Monens. p. 31.—Johnston, Berwick. Club, vol. i. p. 266. — Macgilliv. Moll. Aberd. p. 126. — Brit. Marine Conch. p. 148, f. 82. — Brown, Illust. Conch. G. B. p. 25, pl. 57, f. 14.—Alder, Cat. Moll. Northumb. and Durh. p. 68.
„ *glaucina*, Philippi, Neue Conch. vol. ii. p. 44, Nat. pl. 2, f. 10, 11.
„ *monilifera*, *young*, Brown, Illust. Conch. G. B. pl. 13, f. 1, 2.
„ *glaucina*, Philippi, Neue Conch. vol. ii. p. 10, Nat. pl. 2, f. 10, 11.

The shell is rather small, more or less solid, and of an oblique and somewhat globosely ovate figure, which in the adult is always longer than broad. From the marked attenuation of the body at the posterior extremity (it becomes a little narrower, too, anteriorly) the spire seems somewhat produced: yet it only occupies two-sevenths of the dorsal length. The more characteristic specimens (especially the younger ones) are encircled with five moderately distant bands of short angular or flexuous purplish brown streaks, of which the three lower series are sagittate, and the two upper, the second of which is broader than the rest, and the first of which is continued along the two or three next turns, composed of letter-like markings or oblique and irregular wavy lines. The ground-colour of the smooth and highly-polished exterior ranges in tint from creamy white or very pale fawn to livid or chestnut; sometimes, indeed (and chiefly in the more aged examples) this last colour entirely obscures all but the subsutural streaks; and sometimes the shell is almost wholly devoid of colouring, yet vestiges of the bands are usually to be traced by those who look for them. The body is very large, moderately ventricose, more rounded below, where its declination is moderately sudden, than it is above, where it shelves considerably, and is slightly flattened, or is occasionally even in some slight measure retuse. The spire is composed of five, or five and a half coils, whose volutional increase, especially that of the penult, which becomes abruptly higher than the preceding turn, is more or less rapid. They shelve into each other, from the quickness with which they taper above, which diminishes their appearance of convexity, so gently, that the fine and oblique suture (which is never margined with white) seems but slightly impressed; the apex is small and not much projecting. The mouth fills about two-thirds of the ventral length, and is of a nearly oval figure, that is rather more broadly rounded below than above: its basal recedence (on which depends the angle of the spire's elevation) is moderate; the throat is smooth, and usually nearly white.

The outer lip arches downwards, so as to form an acute angle, at its superior junction, with the body. The umbilicus, which is environed by a narrow strip of colour (chestnut, brown, tawny, or chocolate), adjacent to which the surface is whitish or paler than usual, is simple, smooth internally, moderately large, yet in some slight degree (in the young almost entirely) narrowed by the enamel of the inner lip, which, as it diverges thence, runs to the columella in a much more slanting line than in the preceding species, consequently its angle is much more obtuse and less decided. The pad of enamel which strengthens the outer lip, at its origin, is white; the rest of the callus of the inner lip (it is rather thickly yet not very broadly spread) is sometimes white, sometimes stained with livid brown. The pillar is pure white, solid, and greatly rounded at its basal union with the opposite lip. A fine example measured ten lines in length, and two less in breadth.*

The species abounds on most sandy shores, where at low water it may be detected by the little hillock of sand under which it has buried itself.

By a most interesting suite of examples, Mr. Jeffreys has clearly demonstrated to us that the *Nerita nitida* † of Donovan is merely a milk-white variety of this species. As the links or intermediate examples are rarely to be obtained, we mention the two most important. The first differs from the typical *Alderi* in being of a paler hue, with an opaque white band beneath the sutures; here and there a faint trace of one or two of the articulated zones is clearly perceptible; the pillar lip is white, but there is an isolated stain or two of chestnut round the umbilicus. The next resembles the preceding in other respects, but is perfectly devoid of all brown markings, and of a flesh-colour that changes into white at the base of the body-whorl. The typical *nitida* is of a pure uniform and highly lustrous white: it is very rare, but is occasionally taken alive on different parts of our coast.

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* It is just possible that the *Nerita lævida*, thus briefly described by Laskey in the "Memoirs of the Wernerian Society" (vol. i. p. 409), may be a variety of this shell: "Bears some resemblance to *glaucina*, but has a more produced apex, and is divested of the markings of that shell."

† A little West Indian species, the *Natica acuta* of Philippi (Wiegm. Archiv. Naturg. 1845; Neue Conch. vol. ii. p. 41, Nat. pl. 2, f. 3, altered to *Philippiana*, Nyst, in the Index; perhaps the *lactea* of Guilding, Tr. Lin. xvii. p. 31), is occasionally so named in collections, and in all probability was what Montagu

The animal is of a wan yellowish white hue, speckled with tawny spots of various dimensions, and more or less elongated and streaky in form. These are most numerous on the reflexed lobe of the mentum, and on the central portion of the tail. There is no defined coloured border to the mentum. The sole of the foot is white, tinged with tawny. The tentacula are linear lanceolate, white, with acute tawny tips, the orange or tawny colour of their edges being traversed by a white line. In a colourless or albino variety, taken in the Zetland seas, the animal had scarcely a trace of coloured markings. The operculum is corneous.

This is one of our prettiest and commonest British shells. It ranges throughout our seas, living on all kinds of ground, and ranging from four to as deep as eighty and ninety fathoms. Mr. Alder has found it near Ardrossan in sand at low-water mark. It inhabits the coast of Europe from Gibraltar to Bergen. In the British area

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(Test. Brit. Suppl. p. 150), believing it identical, referred to as "not unfrequent amongst parcels of Occidental shells." Maton and Rackett (Trans. Linn. Soc. vol. viii. p. 225), fancying that Donovan's Caithness shell was the *mammilla* of Linnæus, substituted that name and copied their description of that imperforated Oriental species from the "Museum Ulricæ." Turton (*Ner. mammilla*, Conch. Diction. p. 125) acquiescing in this decision, mixing the umbilical characters of the two shells, describes the perforation as "nearly or quite closed."

it appeared first during the epoch of the red crag, and lived through that of the northern drift.

N. SORDIDA, Philippi.

Large, subglobular, uniform chestnut; body not attenuated above; spire much depressed; umbilicus open, smooth, edged with a coloured band; enamel of the inner lip chocolate.

Plate C. fig. 5, 8, and (Animal) Plate P P. fig. 3.

Natica fulva, THOMPSON, Ann. Nat. Hist. vol. v. p. 99 (no description).
.. *sordida*, PHILIPPI, (not Swainson) Moll. Sicil. vol. ii. p. 139, pl. 24, f. 15.—THOMPSON, Ann. Nat. Hist. new ser. vol. iii. p. 352 (no description).
.. *allied to monilifera*, FORBES, Ann. Nat. Hist. vol. xiv. p. 413.
.. *plumbea*, PHILIPPI (not Lamarck), Neue Conch. vol. i. p. 15, pl. 1, f. 5.
.. *proxima*, SEARLES WOOD, Crag Moll. vol. i. p. 143, pl. 16, f. 4, fossil.

As the *N. sordida* of Swainson's Zoological Illustrations is specifically identical with the *plumbea* of Lamarck, we are enabled to retain that appellation for the present species; had not the name *proxima* been applied, under the supposition that the species had never been previously described, we should have held it right to have adopted it in preference.

This shell partaking of the characters of both the preceding species, when large approaches more nearly to *monilifera*, when small to *nitida*. A long suite of examples in the collection of Mr. M'Andrew forbids the annexation of it to either. Our description of *nitida* will for the most part apply to it; its shape, however, is a little broader, and not quite so oblique, and the body is not peculiarly attenuated above. The spire is more depressed than in the species we are comparing it with, and the whorls are consequently less rounded, and often a little flattened horizontally above.

No coloured markings adorn its exterior, which is of an uniform chestnut or livid hue, except near the anterior extremity, where it becomes white or pallid as in *nitida.* The umbilicus is large, and rather open-mouthed. The callus of the inner lip is much thickened, though not very broadly spread, and as well as the pad and the outer edge of the columella is stained with pale chocolate. The operculum is brown. An inch in breadth, and rather more than an inch in length are the dimensions of an adult specimen.

The animal, which we have been so fortunate as to take in full vigour in the seas of the outer Hebrides, is of a general dusky tawny hue, deeply tinged with madder brown. The mentum is very large; its anterior lobe is the most darkly coloured portion of the body; its reflexed lobe is lighter and yellowish at its margins; the angles are rounded but well marked, and the centre slightly emarginate. The sole of the foot is reddish tawny. The tentacula are rather broadly lanceolate, of a pale but dusky reddish white hue. Philippi's note of the colours of the animal of Sicilian specimens sufficiently agrees with our observations of a British example. The operculum is pale and corneous, with a remarkable pearly lustre at its margins.

This species was exhibited at the York meeting as probably new to Britain, by Mr. M'Andrew, who dredged it first in St. George's Channel, in sixty fathoms water, between Scilly and the Smalls; he afterwards took it between Cape Clear and Baltimore, in thirty fathoms water, and off Arran in Scotland, in twenty-five fathoms; also dead in ninety fathoms at the Zetland Isles. The example, of which we have examined and described the animal, was taken with several dead specimens in the Bay of Stornoway in Lewis, in twenty fathoms water. Mr.

Barlee has taken it at Arran in Galway, and at Loch Fyne. Mr. Jeffreys informs us that it was found at Cork by Mr. Humphreys.

It ranges to the Mediterranean, where it was first taken alive by Philippi, who states that it inhabits deep water there. The *Natica catenoides* of Wood, from the Red Crag of Sutton and Walton, comes very near this rare shell, and is probably identical with it.

N. Montagui, Forbes.

Small, rufous, devoid of markings, but with a narrow whitish band or volutional margin below the suture; throat rufous; pillar and pad pure white; umbilicus not environed by a band of colour, partially concealed by a projection of the enamel.

Plate CI. fig. 3, 4, and (Animal) Plate P P. fig. 4.

Nerita rufa, Mont. (not of Born) Test. Brit. Suppl. p. 150, pl. 30, f. 3 (not the young). — Turt. Conch. Diction. p. 126 (from last). — Dillw. Recent Shells, vol. ii. p. 980 (in part).

Natica „ Fleming, Brit. Anim. p. 319.—Brit. Marine Conch. p. 148.

„ *Montagui*, Forbes, Malac. Monens. p. 32.—Brown, Illust. Conch. G. B. p. 25, pl. 13, f. 3, 6.

„ *rutila*, Macgilliv. Moll. Aberd. p. 126; copied, Brit. Marine Conch. p. 253, and Brown, Ill. Conch. G. B. p. 130.

We have followed preceding writers in our identification of the *Nerita rufa* of Montagu, yet feel by no means certain that the shell originally delineated by Montagu was not a West Indian one, that is usually met with in collections from that quarter.

The shell is small, somewhat obliquely subglobose, of nearly equal length and breadth, strong, smooth, and both externally and internally of a rufous flesh colour, or livid rufous cast, that becomes somewhat paler towards the umbilicus, pure white on the pillar lip and at the extreme edge of the outer one, and is margined with a narrow pallid or whitish strip below the sutural line. The dome-shaped spire is composed of from four to four and a half turns, the lowest of which (the penult volution) is about twice as high as the rest united, and rises somewhat abruptly and ventricosely, but becomes depressed, yet neither flat nor retuse, posteriorly ; the surface of the smaller coils is convex, but they are scarcely elevated above the narrow but profoundly impressed subcanaliculated suture. The body, which occupies about five-sevenths of the dorsal length, is simply ventricose, swells out rather abruptly above, is not perceptibly flattened in the middle, and declines at the base in a well rounded but rather rapid fall. The mouth fills about four-sevenths of the ventral length, and about two-fifths of the basal diameter ; it is of a narrow subovate form, being a little more rounded anteriorly, and as usual, is somewhat flattened on the pillar side from the ordinary straightness of the inner lip in this genus. The arch of the right lip is not quite semicircular, but it slants at rather an acute angle, as it projects posteriorly from the body-whorl ; its edge is simple and acute. Both the throat and inner lip are quite smooth. The orifice of the umbilicus is intermediate in shape between a crescent and an arrow-head, being contracted by a convex projection of the pillar lip, which is the termination to a rather broad, but little elevated rounded ridge, which winds up the perforation ; no spiral lines are impressed on its surface, but the corrugations of growth are often very conspicuous. It is sharply defined anteriorly, where it indents the pillar ; the adjacent area is a little flattened, but is not bounded by a distinct further angulation. The white enamel is not much spread upon the body. The operculum is dirty yellow. Our largest examples measure but little more than two-fifths of an inch in length, and rather less in breadth.

The animal is of a white or yellowish-white hue, except the upper and lateral margins of the reflexed lobe of the mentum, which are bordered by a defined and conspicuous line of some breadth, of a claret brown colour. The lobe itself has a tendency to emargination in the centre, and to angularity at the sides. The sole of the foot is white. The tentacula are lanceolate, acute at their tips, and entirely white. The operculum is corneous. Our figure of the animal is from a drawing by Mr. Alder.

This pretty species ranges from Cornwall to Zetland, but can be said to be common only in the North. Mr. Peach has found it once at Govan. We have taken it in thirty to thirty-five fathoms, sand, on the Devon coast, and Mr. M'Andrew has dredged it in fifty fathoms, sand, off Cornwall. In the southern part of the Irish Sea it is very rare, but becomes frequent on the north coast of the Isle of Man (E. F.). It is sufficiently common in the Scottish seas, living on a bottom of sand, gravelly sand, or gravel, in from twelve or fifteen to eighty or ninety fathoms water, as to render an enumeration of its localities superfluous. It is not quite so common along the eastern coast of Britain, but seems generally distributed. Lieut. Thomas observes that it is a decidedly deep water species there, and located upon stony ground. On the Irish coast it has been taken in forty-eight fathoms, off Cape Clear, by Mr. M'Andrew; in the stomachs of gurnards, in Cork harbour, by Mr. Humphreys (Jeffreys); on the Galway coast by Mr. Barlee; and in Belfast Bay, in twenty fathoms, by Mr. Hyndman, and Mr. Getty (Thompson).

Professor Lovén records it as ranging as far north as

Bergen in Norway. It does not appear to occur south of the Celtic region.

N. HELICOIDES, Johnston.

White, longitudinally oval; whorls narrowly scalar above; suture more or less distinctly canaliculated: axis imperforated.

Plate C. fig. 6.

Littorina? LYELL, Philos. Trans. 1835, pt. 1, p. 37, pl. 2, f. 10 (fossil).
Natica Helicoides, JOHNSTON, Report Berwick. Club, 1835, vol. i. pp. 69, 266, with figure.—LYELL, London and Edinb. Phil. Mag. 1840, pt. 1, p. 365, f. 12 (fossil).—MACGILL. Moll. Aberd. p. 127. — Brit. Marine Conch. p. 149. — BROWN, Illust. Conch. G. B. p. 130, pl. 13, f. 24, 25. — SEARLES WOOD, Crag Moll. p. 145, pl. 16, f. 3 (fossil). — MIDDEND. Malacoz. Ross. pt. 2, p. 88, pl. 7, f. 8, 9 (a variety).
„ *canaliculata*, GOULD, Silliman's Journal, vol. xxxviii. p. 197; Invert. Massach. p. 235, f. 161.—PHILIPPI, Neue Conch. vol. ii. p. 43, Nat. pl. 2, f. 12.
„ *cornea*, PHILIPPI, Neue Conch. vol. ii. p. 43, Nat. pl. 2, f. 7 (as of MÖLLER, Moll. Groenl. p. 7).

The shell is thin, a little transparent, quite smooth, and of an uniform dull white hue, that is concealed externally by a fugacious epidermis, which, in fine specimens, is of a somewhat olivaceous yellow, but is horn-coloured in those smaller examples that are more usually taken in our islands; it is of a longitudinally suboval shape, that is nearly equally attenuated at both extremities. The whorls are scalariform, and the narrow flattened ledge has an inward inclination, so that the suture is more or less canaliculated. The body, which is ventricose above, is manifestly attenuated and somewhat produced below, where its basal declination is very gradual and less rounded than in the majority of this genus. The spire, in the adult, is nearly equal in length to half the body; the longitudinal increase of its turns, which are moderately ventricose, and taper but little above, is rather quick; the last two or three are abruptly elevated; the apex is very blunt, and the earlier coils depressed; the penult volution is rather high.

The shape of the mouth, which fills rather less than two-thirds of the ventral length, is oblong-elliptic; it is narrow, yet in the middle is broader than, or quite as broad as, that portion of the body which is in a line with it; its basal recession is very trifling.

The lateral projection of the thin and simple outer lip is not considerable, and its arch does not at all approach a semicircle in extent. A thin layer of white enamel completes the peristome, but is not diffused over the body as in certain *Naticæ*. The outline of the inner lip is a little sinuated, for the body sometimes swells out a little above, and the free edge of the pillar is frequently a little incurved. The pillar lip is at first pressed close to the body, and though straightish in the young, becomes arcuated and dilated in mature specimens at its anterior junction with the right lip, where the slightly patulous base of the aperture is contracted to a more or less distinct angle. There is no axial perforation, but a minute crevice in the fry marks the ordinary position of an umbilicus. The operculum has a dirty yellow cast.

One of our foreign examples (from Newfoundland) is an inch and a quarter long, and eleven lines in breadth, but none of the British examples we have yet seen approach these dimensions: the one originally described by Dr. Johnston measured three-fifths of an inch long and was scarcely two-fifths of an inch in breadth.

This curious and rare shell, with the animal of which we are as yet unacquainted, was discovered by Dr. Johnston on the coasts of Berwickshire. Mr. Howse has taken it at Sunderland, and Mr. Bean informs us that one very fine specimen (in Mr. Leckenby's Collection) has been found at Scarborough. Dr. Knapp has taken several from haddocks' stomachs caught off the Frith of Forth. Professor MacGillivray has found it at Aberdeen. Lieut. Thomas has taken it in fifteen fathoms, Eda Sound; in seven fathoms, Sanda Sound; and in forty fathoms on the east coast of Orkney; in all instances on a coral (nullipore) or shelly ground, never alive, but evidently quite recent. Mr. Jeffreys and Mr. Barlee have dredged it in the Zetland seas, where it has been once taken by Mr. MacAndrew in forty-five fathoms.

It is a boreal and arctic species, and ranges to the coasts of North America. As a fossil it is plentiful in the red crag, and in the mammaliferous crag of Bramerton (Lyell, Searles Wood).

N. PUSILLA, (Say?) Gould.

Small, white, covered with a yellowish ash-coloured epidermis; spire blunt, very short; whorls not scalar: umbilicus a mere chink.

Plate C. fig. 7.

Natica pusilla, SAY, Journ. Acad. N. S. Philadelph. vol. ii. p. 257? — GOULD (1841), Invert. Massach. p. 237, f. 166. — PHILIPPI, Neue Conch. vol. ii. p. 44, Nat. pl. 2, f. 9. — DEKAY, New York Fauna, Moll. p. 123, pl. 7, f. 45.

is pa
not pu

„ *Groenlandica*, BECK (1842) in MÖLLER, Index Moll. Groenl. p. 7 (from type).—HANL. Brit. Marine Conch. p. xxxiv. fig. 55.—KING, Annals Nat. Hist. vol. xviii. p. 243. — ALDER, Moll. Northumb. and Durh. p. 69. — SEARLES WOOD, Crag Mollusc. vol. i. p. 146, pl. 12, f. 5.

„ *livida*, BEAN, Brit. Marine Conch. p. 265.

„ *alba*, "LOVÉN," PHILIPPI, Neue Conch. vol. i. p. 17, Nat. pl. 1, f. 13.

We are not quite certain that this is the species that Say intended by his *Natica pusilla*; it is assuredly, however, the shell identified as such by Dr. Gould.

The shell has a subglobose form that is rather longer than broad, and is about equally narrowed at each extremity. It is moderately strong, quite smooth, and covered with a rather dull pale ash-coloured or yellowish horn-coloured epidermis, beneath which it is pure white. The body is very large, simply ventricose, not at all flattened in the middle, and is well rounded both above and below, yet rather more gradually so anteriorly. The short blunt spire is somewhat dome-shaped, and is usually eroded at the apex; it only fills a fifth of the dorsal length, and is composed of three or four very short quickly tapering compressed, yet convex (not scalar) volutions, that are divided by a fine but profound suture, and are of rather slow longitudinal increase. The aperture, whose basal recedence is rather less than is usual in the *Naticæ*, is of an uniform polished white, of a suboval figure, and rather large, since it occupies at least three-fifths of the ventral length, and measures in a line with the umbilicus quite one-half of the transverse diameter: the throat is quite smooth. The outer lip is thin, sharp, and simple; it projects at right angles to the body, and its sweep is almost a semicircle. The enamel of the inner lip, though not broadly, is rather thickly spread; the pillar lip is wide, and its simplicity is not disturbed by any callous projection or indentation. The umbilical perforation is so narrow as to be scarcely more than a linear chink. Seven lines long, and six broad are the dimensions of the individual specimen measured by us, but we believe that this is not the extreme size that the species attains to.

This very rare species (the animal of which is a desideratum) was taken first by Mr. Bean off the Yorkshire coast. Mr. King has dredged it alive in fifty fathoms on the coast of Northumberland, where it has also been taken by Mr.

R. Howse. A dead specimen was dredged in forty-five fathoms off Rasa (M'Andrew and E. F.) but this may possibly have been a pleistocene fossil. It occurs fossil in the Bridlington beds. It now ranges northwards to the seas of Greenland.

N. Kingii, Forbes and Hanley.

Very small, imperforated, covered with a strong dark yellow epidermis, devoid of markings; whorls not scalar; spire exserted.

Plate CI. fig. 1, 2.

Our description of this strange looking *Natica* (?) is solely derived from an unique example now in the collection of Gwyn Jeffreys, Esq. Its dorsal aspect reminds one of *Lacuna pallidula*, its ventral of an *Anculotus*. It is ovate-acute, oblique, strong enough for its size, not translucent, and clothed with an olivaceous yellow lustrous epidermis, that fits it so tightly as to seem rather an external layer of colouring matter. Beyond mere wrinkles of increase, that are frequent and rather conspicuous, no sculpture either external or internal varies the entire surface. The prominent spire, which is not placed laterally as in the *Lacuna pallidula*, terminates in a small and not peculiarly blunt apex, occupies nearly a third of the dorsal length, and is composed of rather more than three much tapering rounded volutions, that are short, of very quick longitudinal increase (the penult being large in proportion to the earlier turns), and clearly defined by a simple sutural line. The peculiarly broad body is ventricose, yet becomes slightly flattened towards the outer lip; it declines anteriorly in a rather abrupt convex line, and terminates below in a blunt but projecting base that is placed far to the right. The aperture is very large, rounded oval, being scarcely contracted above, and rather broadly rounded below, and of an uniform not much polished white hue; it merely fills three-fifths, at most, of the entire length, and about one-half of the transverse diameter: the basal recedence is very considerable. The peristome is continuous. The outer lip is acute, disposed to expand, and much but not symmetrically arcuated; it projects both laterally and anteriorly, but more especially at the latter place. The inner lip, which is moderately curved below, is rendered solid by the thickness of the enamel, yet is rather laterally appressed and bevelled than, strictly speaking, reflected. There is not even an umbilical crevice.

The specimen, which measures about a quarter of an inch in either direction, was picked up by our friend Professor King, from the refuse of a coble that had been fishing, in the coralline zone, a few miles off Cullercoats, on the coast of Northumberland.

SPURIOUS.

N. INTRICATA, Donovan.

Nerita intricata, DONOV. Brit. Shells, vol. v. pl. 167. — WOOD, Index Test. Suppl. pl. 8, Ner. f. 7 (and as *Natica intricata* also).

,, *canrena*, DONOV. in Rees's Encyclop. (1817), Conch. pl. 11, A. — TURT Conch. Diction. p. 125.—FLEMING, Edinb. Encyclop. pl. 203, f. 17.

Natica Valenciennesii, PAYRAUD. Cat. Moll. Corse, p. 118, pl. 5, f. 23, 24. — PHILIPPI, Moll. Sicil. vol. i. p. 162.—DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 649.

,, *intricata*, FLEMING, Brit. Anim. p. 319.—Brit. Marine Conch. p. 150.— BROWN, Illust. Conch. G. B. p. 25, pl. 13, f. 13, 16.—PHIL. Moll. Sicil. vol. ii. p. 140.

A common Mediterranean species, supposed by Donovan, who introduced it into our Fauna, to have been taken at Weymouth.

The description of Nerita canrena, *in Maton's catalogue of British shells (Linnæan Transactions, vol. viii. p.* 223), *supposed by him to be the present shell, is a mere transcript of the language of the "Museum Ulricæ," in which work three or four exotic shells are united under that appellation. From its general likeness to* Alderi, *it has been included in some of our local catalogues of species, but the evidence of its indigenousness (especially as a Northern species) is, to say the least, suspicious.*

Two shells, the *Nerita tuberosissima* of Montagu, and the *N. glabrissima* of Brown, inserted by Récluz in the genus *Narica,* have been included among our native species. The former is decidedly spurious, a native of the West Indies, and we believe the fry of the *Nar. sulcata* of D'Orbigny.

Nerita tuberosissima, MONT. Test. Brit. Suppl. p. 150, pl. 29, f. 5. — TURT. Conch. Diction. p. 127.
Natica „ FLEMING, Brit. Animals, p. 320. — Brit. Marine Conch. p. 150. — BROWN, Illust. Conch. G. B. p. 25, pl. 13, f. 18, 20.
Narica „ RÉCLUZ, Revue Zool. Cuvier. 1844, p. 6 ; Magasin de Zool. (Guérin's) 1845, p. 35, Moll. pl. 125, f. 2.

Récluz, who believes the species to be possibly identical with the *granulosa* of his Monograph, has compiled his description solely from the descriptions and plates of our British writers. In like manner his *Narica glaberrima* is entirely derived from similar sources.

Nerita glabrissimus, BROWN, Mem. Werner. Soc. vol. ii. pt. 2, p. 532, pl. 24, f. 12.
„ *sulcata,* TURTON (not authors), Conch. Diction. p. 124, f. 56, 57, and p. 257.
Natica „ FLEMING, Brit. Animals, p. 320.
„ *glabrissima,* Brit. Marine Conch. p. 149. — BROWN, Illust. Conch. G. B. p. 25, pl. 13, f. 12.
Narica glaberrima, RÉCLUZ, Revue Zool. Cuvier. 1844, p. 49, and Magasin de Zool. 1845, p. 65, Moll. pl. 135, f. 2.

We feel almost certain that this obscure species does not belong to the genus at all ; the figures of Brown and Turton look more like a *Lacuna,* and the apparent sulci are only designed for "remote longitudinal striæ that are very fine." (Turt.).

VELUTINIDÆ.

The operculigerous lobe, which in *Natica* attains such great dimensions and is reflected upon the shell, is in this family developed in common with the lateral and anteal portions of the mantle, so as to be capable of inverting margins of the shell all around, or to be so completely reflected over the entire shell as to make it " internal " instead of external. The mentum no longer plays that important part which it has in the *Naticidæ*. The head is flanked by simple tentacula, bearing the eyes on bulgings at their external bases. The proboscis is completely retractile. The lingual teeth appear (according to Lovén) to vary in number, but are always arranged in a single axile series flanked by from one to three laterals. There are two branchial plumes. The shell is always auriform, and is sometimes covered with an epidermis. Its orifice is always patulous and entire.

VELUTINA. Fleming.

Shell thin, more or less coriaceous, invested with an epidermis; volutions few, spire short, body whorl ventricose, very large, with an entire patulous aperture: outer lip sharp, peritreme continuous. No operculum.

Animal bulky, head short, broad, bearing two rather obtuse subulate tentacula, separated at their bases by the breadth of the head; on bulgings at their origins externally are the eyes. Proboscis retractile, mouth armed with jaws and a denticulated tongue, armed with a single series of broad, hooked, serrated central teeth flanked on each side by a triple series of laterals, of which the two outer rows are simple and even edged, and the inner ones broad, hooked, and serrated. Mantle ample, thick, more or less reflected on the shell all round. Foot large, obtusely quadrate in front, rounded behind. Branchial plumes two. Male organ hamate, reflected.

This excellent genus was constituted in 1820 by Dr. Fleming for the reception of the *Helix lævigata* of Linnæus. It was once fancied to be a fresh water tribe, but this is a great error; it is among the most strictly marine of mollusks, occurring often far out at sea and at considerable depths.

V. LÆVIGATA, Linnæus (?)

Pinkish, flesh-colour, not membranaceous.

Plate XCIX. fig. 4, 5, and (Animal) Plate O O. fig. 7.

Helix lævigata, LINN. Syst. Nat. ed. 12, p. 1250, probably. — PULTENEY, Hutchins, Hist. Dorset, p. 49. — DONOV. Brit. Shells, vol. iii. pl. 105. — MONT. Test. Brit. vol. ii. p. 382. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 222. — RACK. Dorset Catalog. p. 56, pl. 18, f. 9. — TURT. Conch. Diction. p. 69. — FLEMING, Encyclop. Edin. pl. 203, f. 14, 15.—DILLW. Recent Shells, vol. ii. p. 971.—WOOD, Index Testac. pl. 35, f. 183.

Bulla velutina, MÜLLER, Zool. Danic. pl. 101, f. 1 to 4.

Helix Haliotoides, O. FABRIC. Fauna Groenland. p. 390.

Velutina capuloidea, BLAINV. Manuel Malacol. pl. 42, f. 4.

„ *lævigata*, FLEMING, Brit. Anim. p. 324; Treatise Moll. Anim. pl. 10, f. 31.—FORBES, Malac. Monens. p. 29, animal.—JOHNSTON, Berwick. Club, vol. i. p. 275, with animal. — Brit. Marine Conch. p. 153.—SOWERBY, Conch. Manual, f. 337.—GOULD, Invert. Massach. p. 240, f. 159.—REEVE, Conch. Systemat. pl. 147, f. 1, 2.—DEKAY, New York Moll. p. 154, pl. 23, f. 254.

Velutina rupicola, Conrad, Journ. Acad. Nat. Sc. Philadelph. vol. vi. p. 266, pl. 11, f. 17, 18.
,, *striata*, Macgilliv. Moll. Aberd. p. 160.
,, *Haliotoides*, Möller, Moll. Groenl. p. 10.—Middend. Malacoz. Rossic. pt. 2, p. 104.
Galericulum lævigatum, Brown, Illust. Conch. G. B. p. 23, pl. 19, f. 35, 38.

This thin and semitransparent shell has a somewhat obliquely rounded-ovate figure, which in the adult is broader than it is long; it is of an uniform pinkish flesh colour, never banded (as in *zonata*), and covered in living examples with a rather thickish membranaceous yellowish brown epidermis, which is often raised in thin equidistant spiral ridges where it passes over the numerous, but not crowded, very fine, and little elevated encircling costellar lines, that, although abraded in worn examples, are always more or less distinctly present in well preserved individuals. The volutional increase is of extraordinary rapidity, since the body occupies nearly the entire dorsal area. The spire, composed as it is of only two turns and a half, is not elevated, when the gyration is compact and perfectly regular, above the level of the outer lip; but in the more aged specimens (whose coils are more loosely and obliquely disposed) has some little prominence; it is only sublateral, as the shell is not so greatly produced towards the lip as in the genus *Otina*. The suture is peculiarly distinct, and often sinks in broadly and profoundly above the body, into whose crown the spire seems oftentimes as though it had been forcibly pressed and had drawn in likewise the margin of the final volution. The whorls, whose scarcely raised apex is fine and very small, are really tumid; yet when the shell rests on its aperture, it only appears to be an irregular hemisphere. The basal declination of the body is well rounded, and symmetrically gradual. The capacious aperture is almost orbicular, and fills a large proportion of the ventral area; it is entirely devoid of sculpture, but the muscular scars are decidedly conspicuous. The outer lip is acute, simple, and a little disposed to expand; it springs out horizontally, or else rises a little at its commencement, and arching out with a continuous semicircular sweep, is imperceptibly united to the pillar lip, which last is extremely narrow and not appressly reflected, but almost erect. A very slight coating of shelly matter (usually white or liver-coloured) is spread over the scarcely convex upper extremity of the inner lip; this area is very short in proportion to the pillar lip, which latter, and likewise the outer lip, recede considerably towards the anterior extremity of the aperture. On the removal of the epidermis, the inner lip is usually seen to be slightly severed from the body-whorl, so as sometimes to look like an umbilical chink; but there is no real axial perforation. Fine examples will occasionally measure almost three quarters of an inch in length, and nearly an inch across at the broadest part; but such dimensions are by no means common.

The young may be readily distinguished from the adult *Otina* by their pallid hue, more orbicular shape, broader spire, and narrow pillar lip.

The animal is entirely white; the mantle has a tumid border which is slightly reflected upon the shell. The head is short and tumid, and contains a rather short retractile proboscis. It is flanked by two long subulate rather thick tentacles, set widely apart and bearing rather small eyes placed on bulgings at their external bases. The foot is steep-sided, rather long, obsoletely truncated and angulated in front, rounded behind, and presenting neither operculum above, nor medial groove below. The liver is large and red. The axile tooth of the tongue (which we have compared with Lovén's figure and description) is broadly quadrate and hamate with a serrated apex and prominent central denticle. The two first laterals are serrated at their upper hooked borders also, and have a large tooth at their inner sides. The second and third laterals are simple and uncinate.

This species is so generally distributed through the British Seas that to enumerate localities would be superfluous. It inhabits various depths of water from the Laminarian zone to thirty fathoms, and is most frequent on a shelly ground. It has a wide range extending throughout the Celtic and Boreal Seas, and along the shores of Boreal America. According to Middendorff it ranges throughout the Icy Sea, and is found on the coast of Kamtschatka. It occurs fossil in the mammaliferous crag.

V. FLEXILIS, Montagu.

Greenish yellow, perfectly membranaceous.

Plate XCIX. fig. 6, 7, and (Animal) Plate O O. fig. 6.

Bulla plicatilis, MÜLLER, Prodr. Zool. Danic. p. 2924 ! (teste Lovén).
„ *flexilis*, MONT. Test. Brit. Suppl. p. 168. — LASKEY, Mem. Werner. Soc. vol. i. pl. 8, f. 6. — TURT. Conch. Diction. p. 25. — FLEMING, Brit. Anim. p. 294.
Velutina plicatilis, LOVÉN, Index Moll. Scandinav. p. 15. — ALDER, Moll. Northumb. and Durh. p. 69.
Coriocella flexilis, MACGILLIV. Moll. Aberd. p. 161.
Sigaretus „ BROWN, Illust. Conch. G. B. p. 23, pl. 2, f. 3, 4.

Though Müller, as a writer, was long prior to Montagu, his description of the *Bulla plicatilis* is so utterly inadequate for its identification (four characters only are mentioned and no figure referred to), that we have preferred the epithet bestowed on it by the later but more accurate naturalist. This strange-looking shell reminds one of

Lamellaria perspicua in shape, and of a *Succinea* in colour and texture. It is glossy, transparent, and so membranaceous as to permit of much indentation without fracture, though its substance is extremely thin ; and is of a greenish amber hue, with a slight disposition to nacre internally. The shell, whose shape is obliquely oval, and broader than long, appears so much depressed when placed on its mouth, as to be considerably less than a hemisphere, although the body is much swollen (the swell diminishing, however, towards the laterally produced lip), this seeming flatness results chiefly from the peculiar basal recedence of the pillar lip. The surface, though not distinguished by any prominent sculpture, is not quite smooth, but exhibits both wrinkles and waves of growth, besides some faint indication of depressed spiral costæ, which are most perceptible in the middle of the final whorl. The spire, comprehending barely a single volution, whose nucleus is blunt and large, is scarcely, if at all, raised above the top of the very ample body, to which it is placed laterally, occupying a very small portion of the breadth of the shell. Both turns are simple in their convexity (devoid of any retusion or flattening of surface) and are divided by a simple but profoundly impressed suture, towards which the margin of the body-whorl, whose basal declination is not planulate, bends convexly inward. The aperture is most capacious, filling more than three-fourths (usually indeed five-sixths) of the ventral surface, and rising almost to the level of the apex of the spire. The general contour of the mouth is obliquely subrhomboidal, the basal portion of the very sinuous pillar lip is comparatively straight, and forms rather more than a right angle with the straightish anterior portion of the outer lip, that runs almost parallel to the upper end of the inner lip, where the swell of the body is so trifling as scarcely to curve it. The posterior or upper edge of the acute outer lip is more arched and elongated than the rest (the opposite and subparallel margin is likewise produced) sweeps gently downwards, but bends abruptly at its termination, which is rather below the middle of the shell. The lips are connected by a thin enamel. No vestige of an umbilicus is visible behind the pillar lip, which is thin, very narrowly reflected, and greatly receding. The edge of the aperture is not on a level, but is somewhat incurved in the middle. A fair-sized example measured almost the third of an inch in length, and five lines and a half in breadth.*

We have twice been so fortunate as to take this remarkable animal alive. It is of the brightest orange colour, and, when brought out of the water had the aspect of a *Pleurobranchus*. The head is lunate and flanked by two linear, obtuse tentacula, set widely apart, and bearing rather large eyes on prominent bulgings at their external bases. The foot is oblong, large but not steep-sided, truncated and angulated in front, rounded behind. The mantle is largely reflected on the shell, very tumid and puffy. The branchiæ are pale red. The general orange hue of the body and mantle is varied by yellowish opaque specks. When last taken it was adhering to a stone in twenty-five fathoms in Loch Fyne (M'Andrew and E. F.); we placed it in a vessel of water, where it, to our surprise, preferred swimming to creeping. The first time we met with it was in twenty fathoms, Stromness Bay, Orkney (J. Goodsir and E. F.). It has been taken several times at Northumberland (Alder); and was originally found on the east coast of Scotland by Captain Laskey. It ranges through the Arctic Seas.

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* The *Helix coriacea* of Pallas (Act. Petropol. 1784, vol. ii. pl. 7, f. 31, 32, 33), a native of the Kurile Islands, approaches this strange *Velutina* (?) in most of its characters, but attains to a comparatively gigantic size.

LAMELLARIA. Montagu.

Shell thin, smooth or striated, auriform, spire depressed and very small, body whorl greatly expanded and patulous, pillar lip greatly receding, aperture very large, entire. No operculum.

Animal with the mantle entirely investing the shell, emarginate in front; head rather broad, with two subulate tentacles, separated at their bases and bearing the sessile eyes at their origin externally; proboscis retractile, long. Tongue linear, armed with teeth; axile denticle with an apical serrated hook, laterals one on each side, very large, broad, hooked, and serrated. Foot oblong, obtusely quadrate in front, rounded behind.

The genus *Lamellaria* as originally constituted by Montagu included very dissimilar mollusks, those which we here retain under it and those to which the appellation *Pleurobranchus* is applied. The original definition was, "body formed of two fleshy lamellæ; the vitals protected by a convoluted shell concealed beneath the skin; foramen on the right side." The two sections of his genus "with, and without plumes," are equivalent to the two genera just mentioned. As the *Bulla Haliotoidea* had been previously described, Montagu does not repeat the account of it, but simply mentions it *first* among his species, as belonging to his new genus. In the descriptions appended to the paper (which is contained in the eleventh volume of the "Linnean Transactions"), *Lamellaria membranacea*, which is a *Pleurobranchus*, comes first. For this reason Mr. Searles Wood regards that species as Montagu's type, and rejects the name *Lamellaria* for the species here so called. But Montagu does not seem to have entertained the notion of considering the animal alluded to as his type; but rather to have so looked upon *Bulla haliotoidea*, which is the *Lamellaria perspicua* of this work. In common with Lovén, Alder and Gray, we reserve the name *Lamellaria* for that shell and its congeners. In the Crag mollusca the MSS. genus, *Marsenia* of Leach, is used in this sense. *Coriocella* of De Blainville is the same genus, but was founded through a mistake, the mollusk having been supposed to possess no shell.

Lamellaria is regarded by Lovén as the type of a family, which in his arrangement, founded on the dental system, he places between *Cypreacea* and *Velutina*. In Mr. Gray's most recent classification, that naturalist follows Lovén in the family arrangement, but places it far away from *Velutina* and *Natica* (which he oddly regards as Phytophagous mollusks), at the end of his Zoophagous Pectinibranchiata. For the present we are content to keep them in the immediate vicinity of *Natica*, with which genus, and with *Velutina*, they have unquestionable affinities. The main mass of mantle which envelopes the shell is probably equivalent to the operculigerous lobe of *Natica*, developed here to a still greater extent, so as to supersede the necessity of an extreme development and replication of the mentum.

The species of this genus are extremely difficult of distinction, in consequence of the close similarity of the shells. At present it is impossible to say how many forms there are even in Europe. A careful examination and delineation of the animals and comparison of the shells made when both are fresh, will be necessary before we can arrive at a sound judgment respecting them.

L. perspicua, Linnæus.

Shell more convex than in *tentaculata*.

Plate XCIX. fig. 8, 9, and (Animal) Plate P P. fig. 1.

Helix perspicua, Linn. Syst. Nat. ed. 12, p. 1250.
Bulla Haliotoidea, Mont. Test. Brit. p. 211, pl. 7, f. 6; and vol. ii. vign. f. 6, animal. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 123. — Rack. Dorset Catalog. p. 43, pl. 22, f. 5*.— Turt. Conch. Diction. p. 24.
Sigaretus Neritoideus, Delle Chiaje, Memorie Anim. s. Vert. vol. iii. pl. 47, f. 6, 7.
,, *Haliotoideus*, Fleming, Brit. Anim. p. 360. — Brown, Illust. Conch. G. B. p. 23, pl. 2, f. 1, 2. — Gould, Invert. Massach. p. 244, f. 158.—Dekay, New York Moll. p. 153.
,, *Kindelianus*, Michaud, Bullet. Linn. Soc. Bordeaux, 1828, p. 120 (f. 2), copied. Fêrus. Bull. Sc. Nat. vol. xvii. p. 308.
,, *perspicuus*, Philippi, Moll. Sicil. vol. i. p. 165, pl. 10, f. 5; vol. ii. p. 142.—Brit. Marine Conch. p. 154, f. 77.
Oxinoe glabra, Couthouy, Bost. Journ. Nat. Hist. vol. ii. pl. 3, f. 16.
Coriocella perspicua, Kuster. Chemn. Conch. Cab. (ed. Kust.) vol. vi. pl. 2, f. 5, 6.
Lamellaria ,, Alder, Cat. Moll. Northumb. and Durh. p. 70.

No difficulty can arise in distinguishing this *Haliotis*-shaped shell from any species of the British Fauna (the next excepted); but the discrimination of it from its foreign congeners is a task of far more uncertainty, and one in which he who essays it will be more aided by the pencil of the artist (for it is almost impossible, at least without verbosity, to express and define with accuracy the modifications and proportions of form) than by the pen of the describer.

The shell is very thin, nearly transparent, and of a shining, snowy whiteness; although smooth, it is conspicuously marked with numerous fine wrinkles of increase, which are chiefly apparent beneath the sutures. The shape is nearly oval, and somewhat oblique; it is composed of not quite three turns, of which the final one occupies nearly the entire area, since the spire is scarcely elevated, and the breadth of the penult turn is merely the eighth of that of the body-whorl, so extremely rapid is the increase, in both directions, of the volutions. When resting on its mouth, the shell seems greatly depressed, not being even hemispherical; yet this depression is rather apparent than real (for the surface of the whorls is well rounded), and results from the extraordinary recession of the pillar lip. The basal declination of the body is abrupt, but not at all planulate, and that portion of the ventral surface, which flanks the aperture on the left, is well rounded, and though narrow, not so much so as in *tentaculata*. The penult turn rises with moderate abruptness and some slight elevation, and even the tiny apical nucleus is not quite flattened. The simple suture is well defined through the convexity of the whorls, and is neither preceded nor succeeded by any canaliculate retusion. The immense aperture, which discloses the whole of the internal gyration, is not very much broader than long. The course of the outer lip is almost semicircular; its chief swell is rather below the middle. There is not the slightest vestige of any umbilicus, the pillar lip being acute and not at all reflected. The sinuation of the inner lip is very curious; it swells out a little at first beneath the spire, is then most profoundly incurved, and finally shelves very slowly downwards in a comparatively straight line. Few individuals measure more than two-thirds of an inch at the greatest width.

Montagu was the first naturalist who described and figured the animal of this species; and as considerable doubt hangs over the determination of its European congeners, we transcribe his account. He states that the animal is " oval, reddish or brownish, sometimes nearly white. The upper part of the body is very convex, covered with a thick, tough ligamentous skin, that conceals the shell and extends downwards on each side, where the edges are thin and detached from the body. On the forepart of this margin is a sinus, through which the animal protrudes an appendage or arm, somewhat flat, a quarter of an inch in length, the extremity of which is bifid; the lower division terminating in a thread-like process. The body of the animal beneath, or rather the sustentaculum, is oblong and flat, with a deep depression between it and the marginal skin; the head is furnished with two small white tentacula, at the base of which are two small black eyes. It is possessed of considerable locomotive powers, and when in motion frequently contracts the margin or loose skin into wrinkles, or folds, exposing the sides of the body. It is in size three times as large as its shell, and is incapable of much contraction or expansion." The specimen we have figured was taken on the west coast of Ireland, and was nearly white. It was slightly pustulated on the back.

It appears to range throughout the British seas but very sparingly, inhabiting the laminarian zone and the belt of nullipore. Montagu had it from Devon and Dorset. Exmouth (Clark); Tenby (Lyons); Isle of Man, in eighteen fathoms (E. F.); Skye (M'Andrew and E. F.); Scarborough (Bean); in shallow water, Northumberland (Alder); in seven fathoms, Dudgeon, alive on fuci in Kirkwell Bay, and in fifteen fathoms, Eda Sound, Orkney (Thomas); Loch Carron (Jeffreys); on both sides of the Irish coast, sparingly (Thompson); Dublin Bay (Hassall); Bantry Bay (Jeffreys).

L. TENTACULATA, Montagu.

Shell resembling the last, but the whorls less convex, the spire more depressed, and the portion of the body on the left of the aperture narrower and rather flatter.

Plate XCIX. fig. 10, and (Animal) Plate P P. fig. 2.

Lamellaria tentaculata, MONT. Trans. Linn. Soc. vol. xi. (1811) p. 186, pl. 12, f. 5, 6.—JOHNSTON, Mag. Nat. Hist. vol. ix. p. 229. —LOVÉN, Index Moll. Scandinav. p. 16.
Bulla „ TURTON, Conch. Diction. p. 25.
Sigaretus tentaculatus, FLEMING, Brit. Anim. p. 360.— Brit. Marine Conch. p. 154, f. 3.
Coriocella tentaculata, JOHNSTON, Report Berwick. Club, vol. i. p. 275.

It is from the characters of the animal rather than those of the shell that the distinctness of this species must be deduced. For the shell only differs in the smallness of its size, the lesser elevation of its earlier whorls, the greater depression of its body, and the greater narrowness, and perhaps flatness, of that portion of the final whorl which flanks the aperture on the left.

Montagu described his animal as having a suborbicular depressed body, convex above, of a yellowish colour, speckled with bright brimstone, and marked with round particles, interspersed with a few black spots; the front of the mantle with a sinus; the tentacula two, long and filiform, with two black eyes placed at their external bases, and conspicuously visible through the transparency of the covering lamina; the sustentaculum oval. He mentions a variety destitute of black spots, and having the yellow markings most conspicuous. He lays much stress on the colour, and the long and slender tentacles.

Except that the dark colour runs into cloud-like or patchy markings, we do not see much distinction between the species described and figured by Montagu, and that which we have represented in our plate, from a drawing of a specimen taken at Swansea, kindly communicated by Mr. Spence Bate. Lovén describes the animal as having a depressed subverrucose mantle, of a fulvous hue, painted with rufous, contrasting these characters with the convex thick tuberculous mantle of a cineraceous hue, striolated with black, and spotted with fulvous, which he assigned to the *perspicua.* We are inclined to think that little stress can be laid on colour alone in this genus.

An examination of specimens of Mr. Bate's shell, and of other drawings of his animal, confirm us in this opinion, and we cannot see any essential difference between the former and examples of *L. tentaculata* in Mr. Jeffreys' collection, from Devon, procured by Mr. Clark, and regarded by him as such. Whether a still more depressed form, marked by Mr. Jeffreys as "*Marsenia complanata* of Leach," be distinct, is yet to be seen.

Mr. Bate observes, "I think they cast their outer shells like toads; my reasons for supposing so is based on the following circumstance. After the animals had been kept a few days, the epidermis around the siphon began to separate, and continued to do so, until I removed it with my fingers. The colours beneath were bright and beautiful."

It seems to have a wide range. Falmouth (Cocks); Swansea (Jeffreys and Spence Bate); Weymouth (Barlee); Scarborough (Bean); among rocks at low-water, Cullercoats (Alder); Arran, in Ireland (Barlee).

CANCELLARIADÆ.

The genus *Cancellaria*, the type of this group includes numerous and beautiful species, but none of them are inhabitants of the British seas. They are remarkable for variety and elegance of outline and sculpture, and sometimes for colour. They, and all the members of the family, have shells with very angular apertures, and an attempt at the extremity of the columella towards the formation of a siphonal canal. The mantles of the animals have a rudimentary siphonal fold to correspond. Their tentacles are subulate with eye-bulgings, as in the *Muricidæ*, and their heads furnished with a retractile proboscis mark their position among the *Gasteropoda*, in the neighbourhood of the same family, from which, however, their dentition, which closely approaches that of *Velutina* and *Natica* definitely separates them.

The genus *Admete*, still existing in the Greenland seas, had once a representative in Britain, the *Admete crispa*, or *Cancellaria viridula* of authors, still surviving as an inhabitant of the Arctic seas, and of the coasts of Boreal America.

TRICHOTROPIS. Broderip and G. B. Sowerby.

Shell more or less turreted and fusiform, spirally ridged, covered with an epidermis which is usually setose ; apex of spire acute ; aperture pyriform, angulated below, so as to simulate a rudimentary canal; columella flattened, perforated. Operculum corneous, subconcentric, its nucleus lateral.

Animal with a short broad head, flanked by subulate tentacles set wide apart, bearing the eyes at the extremities of their thickened lower halves (or connate sustentacula); mouth inferior, proboscis long, retractile, tongue with a single series of hooked and serrated central denticles flanked by three rows of curved laterals on each side, of which the innermost only are serrated. Siphon scarcely exserted, distinct; margins of mantle simple, not reflected: foot broad, quadrate in front, rounded but not produced behind.

Of this very curious genus but few species are known, and those yet discovered are natives of the Boreal Seas.

T. BOREALIS, Broderip and Sowerby.

Plate CI, fig. 5, 6, and (Animal) Plate II. fig. 1.

Murex carinatus (not of Pennant), LASKEY, Mem. Werner. Soc. vol. i. pl. 8, f. 9 (copied by BROWN, Ill. Conch. G. B. pl. 5, f. 31, 32, 33) probably.

Trichotropis borealis, BROD. and SOW. Zool. Journ. vol. iv. p. 375.—MACLAURIN, Berwick. Club, vol. ii. p. 40.—ALDER, Cat. Moll. Northumb. and Durh. p. 66.—GOULD, Invert. Massach. p. 300, f. 207.—DEKAY, New York Moll. p. 137, pl. 8, f. 178. —MIDDEND. Malac. Rossica, pt. 2, p. 108.

Fusus umbilicatus, SMITH, Mem. Werner. Soc. vol. viii. pt. 1, p. 98, pl. 1, f. 2.

Trichotropis costellata, COUTHOUY, Boston Journ. N. H. vol. ii. p. 108, pl. 3, f. 2. —JAY, Cat. Shells, ed. 2, p. 113, pl. 1, f. 17, 18.

„ *acuminata*, JEFFREYS, Malacolog. Magaz. pt. 2, p. 36 (no description).—BROWN, Illust. Conch. G. B. p. 126, pl. 57, f. 15.

„ *Atlantica*, BECK in Möller, Index Moll. Grœnl. p. 12, from types.

„ *conica*, MÖLLER, Index Moll. Grœnl. p. 12 (from description) probably.

Fusus Laskeyi, MACGILLIV. Moll. Aberdeen. p. 170.

Trichotropis umbilicatus, MACGILLIV. Moll. Aberd. p. 330.—Brit. Marine Conch. p. 209, f. 54.

The shape of this curious shell, which, although of not very solid texture, may be termed strong as compared with its congeners, is of a somewhat turreted oval or oboval figure, acuminated at both extremities, more abruptly so in front, more gradually and slenderly so behind. Its surface, which is of an uniform white, or very pale fulvous orange, is veiled externally by a membranaceous epidermis of a squalid yellow hue; this becomes lamellar at regular short intervals, and is there produced into lanceolate bristles upon the raised spiral sculpture. Two principal narrow, but much projecting, rounded cord-like ribs, one medial, the other subbasal, with oftentimes a rather smaller intervening one, revolve around the volutions of the spire, and are succeeded upon the body-whorl by about five or six moderately distant additional ones (each occasionally with a very fine intermediate parallel costella); moreover the entire surface is longitudinally corrugated by most densely disposed delicate raised thread-like lines, which are peculiarly oblique beneath the suture, where two or three very depressed narrow costellæ are visible above the principal costæ. The body, which tapers somewhat retusely at the base to a very sharp point, is very slightly, if at all, longer than the spire, which consists of five moderately high rather quickly increasing volutions, that are divided by a peculiarly broad and profoundly excavated moderately slanting suture, and are obliquely subplanulate above, and nearly perpendicularly erect below. The apex, which is frequently a little arched, is small, but not very acute; it is somewhat obliquely coiled, so as to remind one a little of the nucleus of *Odostomia*. About one half of the ventral length is filled by the rather large aperture, which is usually white, more rarely and only in such as are tinged with colour externally, of an orange brown; it is ovate-subtrigonal, being broad above, and acutangular below. There is some disposition to expand in the acute and simple outer lip, which abruptly juts out in a straightish line from the body at rather an obtuse angle, turns down at rather more than a rectangle in a scarcely convex curve, and eventually slants in an almost rectilinear direction to the peaked anterior extremity. No sculpture adorns the moderately incurved inner lip; the edge of the compressed and narrowly reflected pillar lip is not appressed, so that there seems a kind of subumbilical chink behind it. The operculum is much wrinkled across, and is small for the size of the aperture; in the white examples it is dirty yellow, but becomes darker in the stained ones. Our British specimens are usually five or six lines long, and three or four lines broad.

The variety *acuminata* is an interesting one. The spire is so peculiarly produced as considerably to exceed the length of the body, on which latter the inferior keels are almost, if not wholly, obsolete, so that the conspicuous carinæ alone are present.

Animal entirely white, head lunate, tentacula with subulate terminations and thickened sides for half their lengths, bearing the black eyes on the extremities of the thickenings. Siphon well marked, but not projecting; foot broad, truncated and angulated in front, obtuse, and rather short behind. Operculum somewhat polygonal, corneous, presenting marked indications of the successive layers which form segments of a circle in the inner side of the lateral and rather inferior nucleus.

This is one of our rarer and more local British shells, and is a member of our boreal fauna. It is found in various depths of water from fifteen to eighty fathoms, and more, frequenting various kinds of sea bottom. It occurs throughout the Clyde region and the Hebrides, and around the Zetlands; also on the east coast of Scotland, and as far south as the coast of Northumberland. Mr. Barlee has taken it on the west coast of Ireland. It ranges throughout the Boreal and Arctic Seas, and dates in ours from the epoch of the coralline crag.

CERITHIOPSIS. Forbes and Hanley.

Shell in all respects according with the characters of Cerithium. Operculum corneous of concentric elements, nucleus terminal. Animal widely different: its head rather broad and short, flanked by two obtusely subulate tentacles, widening slightly at their bases, and set well apart; eyes placed centrally at their origin. Mouth inferior, furnished with a retractile proboscis; tongue armed with teeth which appear to resemble in their arrangement those of *Trichotropis.* Mantle not reflected, furnished with a rudimentary siphonal fold. Foot oblong, subquadrate in front, where it is furnished superiorly with a mentum, obtuse behind, grooved for half its length below, the groove terminating in a perforation: operculigerous lobe well developed.

In instituting a distinct genus for the *Cerithium tuberculare*, however repugnant the proceeding may be to conchological notions, seeing that the shell alone will not enable us to speak even as to its tribe, we feel sure all malacologists, when once they have looked to the structure of this remarkable animal, must agree in the course we have taken. Exotic forms of *Cerithiopsis* will probably ere long be detected among the crowd of *Cerithia.*

This genus has distinct affinities with the *Pyramidellidæ;* but the general assemblage of its characters induce us provisionally to place it with the *Cancellariadæ.* It has probably relations with *Terebra.*

C. TUBERCULARE, Montagu.

Brown, dextral, with three spiral rows of tubercles on each of the principal whorls of the spire.

Plate XCI, fig. 7, 8, and (Animal), Plate O O, fig. 1 and 2.

Murex tubercularis, MONT. Test. Brit. vol. i. p. 270 ; Suppl. p. 116. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 150. — TURT. Conch. Diction. p. 96 (not var.)—DILLW. Recent Shells, vol. ii. p. 758.
Terebra „ FLEMING, Brit. Animals, p. 346.
Cerithium tuberculare, Brit. Marine Conch. p. 193, f. 8.—SEARLES WOOD, Crag Mollusca, p. 70, pl. 8, f. 5, a, b.
„ *pygmæum*, PHILIPPI, Moll. Sicil. vol. ii. pl. 25, f. 26 (probably).

This shell possesses so much general resemblance to *C. reticulatum*, that it is not easy to discriminate between worn examples of it and the more slender forms of that species. It is moderately strong, subulate, subcylindrical (occasionally, however, more ventricose below and less produced above), more or less glossy and opaque, and of an uniform dark or chocolate brown, which changes to rufous-chestnut in dead individuals. Each of the principal or lower turns of the spire—which is composed of from ten to twelve volutions, the three or four first of which (usually absent, from their fragility) are smooth and semi-transparent—is adorned with three spiral rows (the superior with two series only), of large equal-sized concatenated granules or beads, that are formed by the intersection of very numerous and perpendicular narrow ribs, and slightly more distant revolving costellæ : their intervals are free from any other sculpture. These rows are continuous and fill the entire surface of each volution. The body scarcely occupies a quarter of the whole length, and is furnished with a fourth almost plain belt, below which the surface is more or less flattened and compressed, and at most marked with one or two remote and not very prominent spiral riblets. The mouth occupies a quarter of the entire length of the shell, and when perfect (a state in which it is seldom obtained) is slightly longer than broad, and has a rounded rhombic contour, the pillar lip which is dark, broadly reflected, and devoid of sculpture forming a more or less marked obtuse angle with the base of the penult turn, whilst the sharp-edged outer lip, which is disposed to expand, and advances at the anterior extremity, is peculiarly arcuated. The sinus at the base of the aperture is rather long; the canal itself is not particularly so, but is very distinct. Our largest example measured a quarter of an inch only in length, and scarcely a line in breadth.

We had once (on the west coast of Ireland) an opportunity of taking this animal alive, and of making a slight sketch under unfavourable circumstances. The notes of Mr. Clark furnish much fuller information, and the observations and beautiful drawings of Mr. Alder. Through the kindness of Mr. Clark we have had an opportunity of re-examining the animal. The head is rather short, compressed, vertically cloven in front, and furnished with a retractile proboscis. It is flanked by two rather short, inflated, subrotund tentacula, which are not very divergent and are somewhat triangular at their bases. Their tips are obtuse or very slightly clavate; they are frosted and hyaline, and as if edged with a line of intense white. The eyes are placed rather close together, towards the centre of the tentacle-base. The mantle is loose, plain at the margin, and has a fold or rudimentary siphon never extended beyond the shell. The foot is rather long, obtusely triangular, and is often carried (as has also been observed by Dr. Knapp) considerably beyond the head; this, though usual in swimming, we observed not to be so frequent in walking. Beneath it is marked with a very deep median groove, terminating in a perforation; dorsally and caudally it carries on a simple lobe a corneous sub-unguiculated suboval corneous operculum resembling that of *Eulima polita*, except that the upper angle is rounded instead of being pointed. The general colour is white, with dusky markings; in our specimen the tentacles were banded, or ringed with lead-colour. The head and anterior half of the foot are dark. Some specimens are flake white, except some sulphur-yellow points behind the eyes, and behind them, on each side of the neck, a band of minute brownish-red points; also two sulphur-yellow patches, one on each side of the operculum.

This shell, which dates as a British species as far back as the coralline crag epoch, has a similar distribution with *reticulatum*, though it is much scarcer. We have taken it alive, in from four to ten fathoms among *zostera* on the west coast of Ireland (E. F., R. Ball, W. Thompson) in eighteen fathoms on the west bay of Portland (E. F. and R. M'Andrew), and Lieutenant Thomas has found it ranging from seven to forty fathoms among the Orkneys and Zetlands. Mr. Clark found it at Exmouth in the middle levels of the littoral zone, in quiet sheltered pools on the smaller algæ; and Mr. Jeffreys at Falmouth, Tenby, Fishguard, Bantry Bay and Cork. Mr. Barlee found it at Guernsey, also at Oban and Loch Fyne; north west and south of Ireland (W. Thompson). It is a lively animal.

It ranges to the Mediterranean.

We have given a drawing, at plate CV. (f. 1), of a remarkable shell which was taken at Exmouth by Mr. Clark. It appears to differ from some of the varieties of *tuberculare* in no other respect than in the absence of the central row of tubercles on each whorl; an important feature, however, and one that, if constant, is perhaps of specific value. As the specimen is much worn, and has its mouth broken, we nevertheless think it advisable to refer it provisionally to the present species. It is a strong shell, with the tubercles connected by longitudinal riblets, so much so, indeed, that the earlier turns might almost be termed cancellated. In case it prove eventually to be distinct, we propose to name it *Cerithiopsis Clarkii* after its distinguished discoverer.

MURICIDÆ.

This important group includes three Gasteropods which have spiral shells, often turreted, and always furnished with a siphonal canal. Many of the largest of testacea are included in it, and some of the most beautiful shells in the world, whether on account of their exquisite colouring or the singularity and eccentricity of their forms. These Mollusks are all predacious and among the most ferocious of their class. They have all a lunate head, cleft below for the mouth, whence protrudes a long proboscis, armed with a denticulated tongue, the teeth on which are arranged in triple rows of three in a row: the central tooth is always angulated and often armed with denticles, the laterals are usually more or less hamate. They have all two branchial plumes, and are in most instances provided with a corneous operculum, the form of which, when taken in relation to the dentition and the characters of the shell, affords the most important bases for generic distinctions. The *Muricidæ,* though ranging far back in time, are probably much more extensively developed now than anciently; the great majority of members of this family are tropical.

MUREX. Linnæus.

Shell strong, variously shaped, always with a tumid body-whorl, which, with the other volutions is crossed by foliaceous and rib-like varices, in some species tuberculated, in others spinous or fimbriated, often crossed by spiral striæ or sulcations; spire variously elevated, acute. Aperture round or ovate, terminating in a contracted, often much produced canal, which is not unfrequently partially closed. Operculum corneous, unguicular, semi-concentrically lamellated, its nucleus terminal.

Animal, with a broad lunate flattened head, flanked by two tentacula, having stout bases, bearing the eyes at one-half or two-thirds of their lengths; proboscis retractile, moderately long, tongue armed with transverse rows of teeth, each row composed of a central transversely and quadrately oblong axile tooth, with three recurved denticular processes, and two claw-shaped lateral teeth. Mantle lax, produced into a siphon which is not extended much beyond the canal of the shell. Branchial plumes two. Male organ curved, lanceolate, reflected. Foot ovate or subquadrate, rather small, posteriorly obtuse.

M. ERINACEUS, Linnæus.

Rather large, brownish white; ribs usually somewhat foliated.

Plate CII. fig. 4.

KNORR, Délices des Yeux, vol. iv. pl. 23, f. 3.

Murex erinaceus, LINN. Syst. Nat. ed. 12, p. 1216. — PENN. Brit. Zool. ed. 4, vol. iv. p. 123, pl. 76, f. 95. — PULTENEY, Hutchins, Hist. Dorset. p. 43.—DONOV. Brit. Shells, vol. i. pl. 35.—MONT. Test. Brit. vol. i. p. 259.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 142.—RACK. Dorset Catalog. p. 46, pl. 14, f. 7. — TURT. Conch. Diction. p. 87. — FORBES, Malac. Monens. p. 25, animal. — MACGILLIV. Moll. Aberd. p. 168. —Brit. Marine Conch. p. 168.—BROWN, Illust. Conch. G.B. p. 6, pl. 6, f. 5, 6.—BORN, Test. Mus. Cœs. Vind. p. 294, pl. 11, f. 3, 4. — OLIVI, Zool. Adriat. p. 151.—DILLW. Recent Shells, vol. ii. p. 690. — LAMARCK, Anim. s. Vert. (ed. Desh.) vol. ix. p. 591. — WOOD, Index Testaceolog.

pl. 25, f. 19.—Blainv. Faune Franç. Mol. p. 127, pl. 5, f. 1, 2, 3.—Desh. Encyclop. Méthod. Vers, vol. iii. p. 905.—Philippi, Moll. Sicil. vol. i. p. 208; vol. ii. p. 181.—Kiener, Coq. Vivant. Murex, pl. 44, f. 1, 2.—Reeve, Conch. Icon. Murex, pl. 3, f. 11.—Middendorff, Malac. Rossic. pt. ii. p. 121.

Purpura scalata, &c. Martini, Conch. Cab. vol. iii. p. 345, pl. 110, f. 1026, 1027, 1028.

Buccinum longirostrum porcatum, Da Costa, Brit. Conch. p. 133, pl. 8, f. 7.

Murex cinguliferus, Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 597, teste Kiener, Coq. Vivant. Murex, pl. 30, f. 2.

„ *Tarentinus*, Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 593.—Sowerby, Conch. Illust. Murex, f. 24.—Kiener, Coq. Vivant. Murex, pl. 44, f. 2.

Triton erinaceus, Fleming, Brit. Animals, p. 356.

Encycl. Méthod. Vers, pl. 421, f. 4.

This abundant shell, which is acuminated, and nearly equally so, at both extremities, has an angulated oblong-oval figure, is strong, dull, and either squalid white, or tinged with warm chestnut or ochre; it is seldom uniform in tint, for the colouring is usually disposed lengthways (and chiefly behind the varices) so as to shade away into the pallid ground, or is distributed partially on the spiral ribs; sometimes, yet rarely, it is concentrated in two spiral bands that encircle the body. From six to eight varices (most frequently seven) which, in the more characteristic examples alternate in prominence, elevate themselves on the surface of each of the principal volutions, and are surmounted by coarse vaulted acute scale-like projections where they are traversed by the revolving ribs. Each of these last, which are very numerous upon the body (the upper three are alone continued, for the most part, upon the other volutions) has generally a single filiform parallel raised line intervening, and all the raised sculpture is squamosely decussated by crowded longitudinal lamellar wrinkles that roughen the entire surface of the shell. About two-fifths of the dorsal length is usually occupied by the spire, which is composed of six or seven turns, that are neither remarkable for length or volutional increase, are more or less scalariform, being abruptly and perpendicularly elevated below, and more or less horizontally flattened above, and profoundly divided by their broad sutural line. The basal declination of the body is gradual and but little rounded. In adult individuals, where the anterior extremity of the mouth is rendered tubular by the confluence of the two lips, and the broad external varix somewhat contracts the cavity, the aperture is rather small and simply oval; in the young, where the final development has not yet taken place, it looks much larger, and is acutangular below. Measuring from the upper corner of the orifice to the extreme tip of the canal, which is a little recurved and bends slightly to the right, about four-sevenths of the ventral length is occupied by the mouth. Rather obscure dentiform crenations stud the much arcuated inner margin of the right lip, which is rendered very broad and solid by the external varix, and is not armed, as in a somewhat similar looking foreign shell, by any horn-like protrusion. The inner lip, which, as well as the throat, is usually snow-white (though the latter is beautifully tinged with rose-colour or purplish in some few examples), is smooth, nearly perpendicular, somewhat flattened, and only slightly incurved near the middle: the pillar lip is appressly reflected above, but becomes erect towards the canal. Montagu has recorded examples that measured an inch and three-quarters in length, and nearly an inch in breadth, but such are very scarce in collections.

A somewhat dwarfed variety exists, in which the whorls are merely subangulately ventricose, the varices do not foliate at all, but look as if worn down, and the finer scales are scarcely at all developed.

The animal is entirely yellowish-white. The head is rather broad and sublunate, flanked by subulate tentacula which are thickened by the union of sustentacula for more than half their length, where they bear the dark eyes. The proboscis is rather long, the buccal mass is armed by corneous jaws, and by a tongue, the axile teeth of which are broadly and irregularly quadrate, or rather pentangular, and are armed by three denticles, the central one highest in position. The mantle is rather lax, and slightly scalloped at the margin; its siphonal tube is but slightly prolonged beyond the canal of the shell. "There are two branchial plumes of unequal size and length, taking their origin posteriorly on the left, and ascending obliquely to the right; the smaller plume is on the left of the larger at its upper part, and is itself divided by a furrow" (Clark). The foot is small in proportion to the shell, ovate, round when at rest, scarcely angulated in front, and rounded posteriorly; it is obscurely grooved along the centre. The operculum is unguiculated, with its apex terminal, and is marked by semicircular lines of growth.

Murex erinaceus ranges from five to as deep as thirty fathoms, and is probably most abundant between twelve and twenty fathoms on a gravelly or stony bottom. It is common in most suitable localities all round England and Ireland, and becomes a little scarcer as we go north. In the Irish sea it is plentiful. Lieut. Thomas remarks that on the east coast he found it in seven fathoms, in the Estuary of the Thames, at the same depths off the Wold and the Dudgeon, but did not take it to the north of these localities. In the Northumberland catalogue it is mentioned with doubt; we find it, however, in the Aberdeen catalogue. We have taken it, though not frequently, in the Hebrides. It ranges to the Mediterranean, and extends northwards to the coast of Denmark (Lovén). It is found fossil in pleistocene drift, and, according to Sir Charles Lyell and Mr. Wood, was once taken in the mammaliferous crag.

M. CORALLINUS, Scacchi.

Small, rufous or brown, with rounded unarmed ribs.

Plate CII. fig. 5, 6.

Murex gyrinus, LASKEY, Mem. Werner. Soc. vol. i. pl. 8, f. 10, probably.
„ *corallinus*, SCACCHI, Fauna del Napoli, f. 15.
Fusus lavatus, PHILIPPI, Moll. Sicil. vol. i. p. 203.
Murex inconspicuus, SOWERBY (junior); Conch. Illust. Murex, f. 81.—REEVE, Conch. Icon. vol. Murex, pl. 32, f. 64.
Fusus corallinus, PHILIPPI, Moll. Sicil. vol. ii. p. 178, pl. 25, f. 29.
„ *gyrinus*, BROWN, Illust. Conch. G. B. pl. 5, f. 12, 13 (no description).
Murex badius, REEVE, Conch. Iconica, vol. iii.; Murex, pl. 32, f. 159?

The shell is of a more or less oblong-fusiform shape, being attenuated at both extremities, though more acuminately so above, where it tapers to a fine point; it varies as to length, the body being sometimes much more swollen than in ordinary, in which case the usually produced spire is less elongated. It is strong for its size, and of an uniform tint of colour, either rufous or dark reddish brown, which changes in the large dead or very aged examples into reddish yellow. There are no true varices, but the principal whorls are longitudinally traversed throughout by broad prominent shelving rounded ribs, that are least raised beneath the sutures and at the anterior extremity. The intervals of these ribs, of which there are usually about eight upon the body-whorl, are about equally broad, and both alike are ridged by dense spiral costellæ, that are sometimes smooth and rounded, sometimes very delicately and closely squamiferous. The spire is composed of about six or six and a half volutions, which are of rather fast longitudinal increase, and are strongly defined by a simple but profoundly impressed suture; they are rather shelving and flattened or even subretuse above, and somewhat ventricose below, of moderate height in the more elongated examples, and rather short in the more stunted forms. In the ordinary-sized examples about four-sevenths of the total length is filled by the body, but as the spire is produced in the larger and more aged individuals (and these are rarely taken with the mollusk tenanting them) the usual proportion is reduced to one half; it is only moderately ventricose above, and rather narrowly peaked below, the attenuation or basal declination commencing rather early and being tolerably convex. The aperture barely fills one half of the total length, is of an oval-oblong figure above, and terminates below in a tolerably straight and rather long canal, that is often partially closed over above. It is sometimes white, sometimes liver-coloured, sometimes dirty violet or lilac, and is greatly contracted in the more mature specimens by the solidification of an outer lip, that is guarded internally by from five to seven dentiform tubercles, which vary as to size, sharpness, and approximation in different individuals. The lip, however, is levelled to a tolerably sharp edge, is unarmed externally, has but little prominence, and is moderately arcuated. The pillar lip is unsculptured, rather broad, not much incurved, and considerably flattened. There is no perforation. The average of size may be stated at half an inch for the length, and a fifth of an inch for the breadth, but here and there a dead individual is obtained that is at least half as large again as those taken alive.

The animal is entirely of a brilliant scarlet colour. The tentacula are rather long, obtusely subulate at their points and thickened for one third of their lengths to bear the dark eyes. The foot is short and squared in front. This shell profusely covers the rocks of the little islet of Herm near Guernsey, towards low-water-mark. On heaving them over we have found it in company with *Fissurella*, *Emarginula* and *Chiton discrepans* (S. H.) In the Mediterranean we have taken it abundantly among seaweeds in the second region of depth (E. F.) It is essentially a southern species, and, like *Haliotis*, reaches the Channel Isles though it does not extend its range to the coasts of England.

Note.—In the collection of the late Dr. Turton, is preserved a specimen regarded by him as the *Murex gyrinus* of Montagu, which fairly enough agrees with the brief description of that shell in the "Testacea Britannica," from which work his own account is manifestly transcribed. Hence, as no proof exists that the example referred to was obtained from Laskey (on whose testimony the species was introduced into our Fauna), and, indeed, is very different from his delineation of it, it cannot be valued as a typical specimen. We feel assured that the same shell did not supply Montagu with his description, and Laskey with his figure. Turton's example, is neither the *gyrinus* of Gmelin, nor a *Ranella* at all, but is in so worn and imperfect a state, that we have failed in identifying it with any adult and perfect shell ; it bears a general resemblance to Kiener's figure of *Purpura fragum*, but is certainly not that species. We have no doubt that the *M. gyrinus*, as described, was not indigenous, and from its very inadequate definition and erroneous identification, do not consider it worth the attention of Conchologists.

LACHESIS. Risso.

Shell strong, turreted, many-whorled, body-whorl not very large, surface crossed by longitudinal ribs and spiral striæ. Apex of spire mammillated. Mouth oval, canal very short, straight, not recurved. Operculum unguiform.

Animal with converging tentacles; siphon very short; foot short ovate.

The above characters are quite insufficient, yet must be adopted provisionally until more is known about the very puzzling little shell, commonly called *Buccinum minimum.* It clearly does not belong to any of our well characterised genera of British *Muricidæ*, and even its position in this family is doubtful. The *Lachesis* of Risso is evidently this shell. His *Anna* to which Mr. Gray has assigned it, was founded for a fossil possibly nearly allied. The genus is probably a littoral and laminarian group.

L. MINIMA, Montagu.

Plate CI. fig. 7, 8.

Buccinum minimum, MONT. Test. Brit. p. 247, pl. 8, f. 2; Suppl. p. 109.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 139.—TURT. Conch. Diction. p. 18.—MACGILLIV. Moll. Aberd. p. 344.—DILLW. Recent Shells, vol. i. p. 639.—WOOD, Index Testaceolog. pl. 24, f. 122.—BLAINVILLE, Faune Franç. Moll. p. 175.—PHILIPPI, Moll. Sicil. vol. i. p. 222, and vol. ii. p. 189, pl. 27, f. 9.

„ *brunneum*, DONOV. Brit. Shells, vol. v. pl. 179, f. 2.

Nesæa granulata, RISSO, H. N. Europe Mérid. vol. iv. p. 223, f. 67.

„ *mamillata*, RISSO, H. N. Europe Mérid. vol. iv. p. 223, f. 69?

Murex Massenæ, DELLE CHIAJE, Memorie Anim. s. Vert. vol. iii. pl. 49, f. 17, 18, 19.

Fusus minimus, FLEMING, Brit. Animals, p. 350.—Brit. Marine Conch. p. 204.

„ *turritellatus*, DESH. Expéd. Morée Zool. p. 174, pl. 19, f. 28, 29, 30, 43, 44, 45; Anim. sans Vert. vol. ix. p. 473.

Buccinum rubrum, POTIEZ and MICH. Gal. Douai, Moll. p. 381, pl. 32, f. 17, 18.

Nassa minima, BROWN, Illust. Conch. G. B. p. 5, pl. 4, f. 25, magnified.

Fusus subnigris, BROWN, Illust. Conch. G. B. p. 7, pl. 5, f. 58, 59, probably.

This little shell has the general aspect of a *Cerithium.* It is turreted above, abbreviated semifusiform below, is strong, a little shining, and both within and without is of an uniform blackish chocolate colour when the animal is alive, but turns rufous after death. The strong and rather distant ridges (of which there are about nine on the principal whorls) that traverse the shell lengthways (the apical coil excepted, which is merely striated in a spiral direction), do not quite extend to the extreme base. They are surmounted and rendered slightly nodose by the very closely disposed and greatly depressed costæ (of which there are four on the principal turns of the spire and about ten on the body) that encircle the entire shell (the nucleus excepted). The spire, which gradually attenuates to a blunt mammillary apex, is composed of five rather high volutions, that are simply and moderately rounded, of rather slow longitudinal increase, and divided by a fine but profoundly impressed suture. The body fills from two-fifths to three-sevenths of the dorsal length, is convexly rounded, but not ventricose, and attenuates gradually to a bluntly acuminated extremity. The mouth, which at times does not exceed one-third of the ventral length, and at others occupies nearly two-fifths of it, is not peaked posteriorly; its shape is an oval, that is produced below in a short and rather suddenly formed canal, that does not lean to either side, and is not recurved. The outer lip is more or less strengthened externally, is moderately arched, simple, and neither lobated, nor sinuated: it is armed within by short coarse raised lines or crenæ, which are rarely present except in perfectly matured individuals. The inner lip does not swell out above, is very concave in the middle, and has no sculpture, not even a posterior pad; the larger portion of it is occupied by the almost perpendicular pillar, whose lip, though inconspicuous, is distinctly apparent. There is no vestige of an axial perforation. The ordinary breadth of individuals is only a single line; the usual length is the fifth of an inch.

The animal is noticed by Philippi. He describes it as entirely black; with long tentacles converging at an acute angle; a short siphon: a foot shorter than the shell, retuse in front, narrowed and obtuse behind; operculum entire.

It is an inhabitant of the littoral and especially of the laminarian zones. In Britain it is confined to the southern coast. Alive, at Jersey, creeping on rocks at low-water, in company with *Rissoæ;* dredged at Weymouth, on weedy ground, in three or four fathoms, along with *Phasianella* (S. H.) Torquay (Mrs. Richard Smith). South of Devon (Rev. Dr. Goodall). Whitesand-bay (Jeffreys). Cornwall, dead in twenty fathoms (M'Andrew and E. F.)

It ranges to the Mediterranean, and is essentially a South of Europe species.

PURPURA. Adanson.

Shell strong, ovate or suborbicular, more or less turreted, body whorl very large: surface sculptured with striations, or sulcations, usually spirally, often forming fimbriated ridges, and sometimes broken up into nodules or tubercles. Aperture ovate or rotund, more or less dilated; the outer lip usually crenated or denticulated; the columella often flattened or subexcavated; base with a short and strongly notched canal. Operculum corneous, subquadrate, lamellar, with a lateral nucleus.

Animal with a broad lunate flattened head, flanked by two tentacula, which have broad and stout bases, composed of the shortened eye-pedicles united with the true tentacles for nearly half their lengths; beyond the eyes the tentacles are stoutly subulate; proboscis reticulate, moderately long, tongue long, armed with teeth, which are ranged three in a row, the middle or axile one broadly quadrate and tridentate, the laterals claw-shaped; jaws linear, corneous. Mantle lax, produced into a short siphon, which is rarely projected far beyond the canal of the shell. Branchial plumes, two. Male organ curved, linear lanceolate, reflected. Foot ovate, oblong, or subquadrate, posteriorly obtuse, anteriorly emarginate.

The species of this genus, like many other Mollusks of the family, secrete a fluid which, when exposed to the air, becomes of a rich purple; and the name *Purpura*, applied by the ancients to *Murex trunculus*, the creature that furnished the famous Tyrian dye, was assigned by the moderns to the generic group now under consideration. Much interesting information on the subject of the purple fluid and its sources, will be found by the reader in Dr. Johnston's delightful Introduction to Conchology.

P. lapillus, Linnæus.

Plate CII. fig. 1, 2, 3, and (Animal) Plate L L. fig. 4.

Lister, Anim. Angl. pl. 3, f. 5, 6; Hist. Conch. pl. 965, f. 18, 19. — Knorr, Délices des Yeux, vol. vi. pl. 29, f. 4.

Buccinum lapillus, Linn. Syst. Nat. ed. 12, p. 1202. — Penn. Brit. Zool. ed. 4, vol. iv. p. 119, pl. 72, f. 89. — Pulteney, Hutchins, Hist. Dorset, p. 41.—Donov. Brit. Shells, vol. i. pl. 11.—Mont. Test. Brit. vol. i. p. 239; Suppl. p. 104. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 135. — Rack. Dorset Catalog. p. 44, pl. 15, f. 1 to 4, 9, 12. — Turt. Conch. Diction. p. 14.—Brookes, Introd. Conch. f. 78. — Dillw. Recent Shells, vol. ii. p. 613.—Wood, Index Testaceolog. pl. 23, f. 62.

Utriculus, &c. Martini, Conch. Cab. vol. iii. p. 428, pl. 121, f. 1111, 1112; p. 433, pl. 121, f. 1113, 1114.

Buccinum canaliculatum purpuro-buccinum, Da Costa, Brit. Conch. p. 125, pl. 7, f. 1 to 4, 9, 12.

Nassa, buccinum, lapillus, &c. Chemnitz, Conch. Cab. vol. iv. pl. 122, f. 1128, 1129.

Buccinum filosum, Gmelin, Syst. Nat. p. 3486.—Dillw. Recent Shells, vol. ii. p. 614.—Wood, Index Testaceolog. pl. 23, f. 63.

Purpura lapillus, Lam. Anim. s. Vert. (ed. Desh.) vol. x. p. 79. — Fleming, Brit. Anim. p. 341. — Peach, Annals Nat. Hist. vol. xiii. p. 203 (nidus). — Couch, Cornish Fauna, pt. 2, p. 62. — Johnston, Berwick. Club, vol. i. p. 239, with animal. — Macgilliv. Moll. Aberd. p. 166. — Brit. Marine Conch. p. 213.—Brown, Illust. Conch. G. B. p. 5, pl. 4, f. 4, 5, 6, 7. —Blainv. Faune Franç. Moll. p. 146, pl. 6, f. 3, 4.—Kiener, Coq. Vivant. Purp. pl. 29, 30, 31, figs. 77 (c, d, e, f, k, l, m, o, p, q, r, s).—Gould, Invert. Massach. p. 301.—Dekay, New York Fauna, Moll. p. 135, f. 175. — Reeve, Conch. Icon. vol. iii. pl. 10, f. 47. — Middend. Malac. Rossica, pt. 2, p. 113.

„ *imbricata*, Lam. Anim. s. Vert. (ed. Desh.) vol. x. p. 80.—Dekay, New York Fauna, Moll. p. 136, f. 173.

„ *bizonalis*, Lam. Anim. s. Vert. (ed. Desh.) vol. x. p. 88 (teste Kiener, Desh. &c.)—Dekay, New York Fauna, Moll. p. 136, f. 174.

So manifold are the guises in which this shell presents itself, that, were it not that its great abundance and the facility with which it is acquired, have enabled naturalists to perceive the connecting links of the very different looking specimens, their specific individuality would assuredly have been denied. These causes, indeed, render the species of much interest to all who strive to ascertain the co-existent conditions by which form, sculpture, and colouring are modified (for it is variable in all these points); and the data obtained by the careful study of a few such species might go far towards the establishment of a sound theory for determining the nice limits of varietal and specific distinction.

The shell is solid, not lustrous, sometimes of a dusky chocolate brown, but generally white or very pale ochre colour, either uniform in tint or stained in the intervals of the ridges with the darker hue (more rarely the converse) or else banded with yellow, brown, or chestnut; in the last case a single moderately broad zone usually winds along the upper part of each whorl, a broad medial and a rather smaller basal one additionally encircle the body. The form, though very variable, being sometimes narrow and elongated, sometimes squat and broad, is more or less oval, swells out nearly in the middle, and attenuates considerably and nearly equally at both extremities. The spire occupies on the average about two-sevenths of the dorsal length, but does not preserve an elevation in exact proportion to the increased or diminished length of the final whorl; it is usually remarkably short where the body is broad, and often is much produced when the body is peculiarly narrow: similarly the aperture in the former will occupy nearly five-sevenths of the length, in the latter merely one-half, or even less. The entire exterior is covered with not much elevated narrow convex spiral ridges (there are generally three or four of these on the penult and preceding volution, and about fifteen—but the number is uncertain—on the final whorl), that are so closely disposed as only to be separated by a broadish sulcus (for, where the space permits, it is filled up by a narrower costella). In general the surface is merely obscurely traversed lengthway by almost obsolete wrinkles, or indistinct waves of increase, but occasionally the corrugations rise in numerous fringe-like imbricating lamellæ that form vaulted scales where they overhang the revolving ridges. A fine and simple suture divides the whorls, which taper above, are of fast longitudinal increase (the penult is moderately high for the most part), are more abruptly perpendicular below, and much more shelving above, where in some of the more produced forms, especially upon the body-whorl, the surface is flattened or even retuse: sometimes the projection of an upper ridge causes the smaller volution to appear angulated. The apex is small, and is somewhat irregularly twisted. The body is more or less ventricose above, and is gradually and convexly attenuated in front to a rather sharp peak. A rather narrow nearly straight and perpendicular canal, which occupies from scarcely two-fifths to nearly half of the orifice, terminates the aperture of adult examples, which in that stage of growth is small and suboval, being much contracted in its dimensions by the breadth of the outer lip. The mouth, and more especially the throat, exhibits many diversities of colouring; if not white, it is usually stained with yellow, pink, flesh, purplish, or brown, but these tints are rarely vivid (the first excepted) but have usually a somewhat livid cast; the darker the exterior, the more intense in general will be the internal hue, and when bands adorn the outer surface, they are usually limned on the interior likewise. The only sculpture which the aperture displays consists of five or six small and rather distant tubercles (the first of which rises at some little distance from the posterior extremity) that guard the entrance of the throat, at the point where the very thick outer lip, which is moderate in curvation and projection, begins to bevel gradually to a tolerably sharp edge. In immature individuals, however, the outer lip is simply acute, and merely displays the external folds at its margin, instead of being tuberculated internally; the aperture, too, is much larger, and the canal not being completed, somewhat pyriformly oval. The inner lip is smooth, appressly or even retusely flattened, and broadly repand; its edge almost vies in concavity with the opposite margin. The average length of adult specimens is only an inch and a quarter; they sometimes, however, attain to fully half an inch more; the breadth is rarely above an inch.

The animal is entirely yellowish white or cream-coloured.

The eyes are black and conspicuous. The head is lunate; the tentacula thickened for more than half their lengths, to carry the eyes on the extremities of their external bulgings, or, in more strict language, combined ommatophori. The mantle is yellowish, with slightly scalloped margins: the edges of its siphonal fold are turned in. The foot is oblong, and when at rest has its anterior part contracted and unfolded. The broad and angular operculum is of a bright tawny colour, and overlaps the membranous rounded short operculigerous lobe. The receptacle of the creamy secretion which furnishes the purple dye lies behind the animal's head, and Montagu observes that it appears whiter than the rest of the animal. The purple hue is not developed until after exposure to air and light, when it passes through successive phases of yellow, green, and blue before exhibiting its royal tint. It appears to be easily fixed, and to become more brilliant by use. It was formerly employed for dyeing fine linen in Ireland (in 1684), but is not applied to any such purpose at present. Reaumur found that its egg-vesicles yielded the dye with less trouble than the parent Mollusk.

These egg-vesicles are little oblong urn-shaped cups, of tough though membranous texture, and yellowish colour tinged often with pink. They are shortly pedunculate and stand erect in considerable numbers, rising from a common membrane which is attached to the surface of rocks or stones, or sometimes on the parent shells themselves. Each contains many embryo *Purpuræ*. Mr. Peach has bred them, and has observed that they change form as the included young ones ripen, the apex of the cup becoming thinner and more convex. He found that so long a time as four months elapsed before the vesicle opened, and then the included whelklings did not quit their cradle all at once, but took their time in coming out, according to their individual dispositions; doubtless the quick-minded and more curious commencing their travels first, whilst those of slow and studious constitutions would remain as long as a fortnight before resolving to see the world, which, with young *Purpuræ*, is no very dangerous adventure, since the neighbouring barnacles enable them to look about with safety, before making a long journey from their birth-place.*

When the *Purpura* grows up, it makes its constant residence in rocks and stones in the middle sub-region of the littoral zone, inhabiting that part of the space between tide-marks, in which *Fucus articulatus* is the characteristic seaweed, when it is the companion everywhere of *Littorina littorea* and *Patella vulgata*, and on the west coast finds itself in company with *Trochus umbilicatus*, on the south with *Trochus lineatus*, all of which, if they had a vote in the matter, would prefer its room to its company, for it is extremely voracious, and when it gets hold of a neighbouring Mollusk, seldom leaves it before at least attempting to swallow it. We have seen a *Purpura* devour a periwinkle in the course of an afternoon when placed in the same vessel of sea-water, sucking its prey as it were out of the shell, after placing the orifice of its own body-case against that of its victim. It perforates shells sometimes also, probably, as Mr. Hancock suggested, by means of its armed tongue. We have a sketch in our possession, drawn by Mr. Spence Bate, of a *Purpura* devouring a mussel. "The whelk," writes our valued correspondent, "attacked the mussel, but it bored where there was no epidermis. I pulled it off, and turned the mussel upside down (the other valve having more epidermis upon it), but in a short time I returned and found that the whelk had turned over the mussel and had resumed its operation at its old bore. This I did twice or thrice, with the same result. Giving up the idea of its boring at any other point, I next thought I should like to see how it managed to devour its prey. For this purpose I divided the muscles of the mussel, so that the valves parted, so as to enable me to observe the work of gormandizing as it proceeded, but to my surprise the animal gave up all idea of boring when there was an easier method of obtaining food, and so passed its proboscis between the valves. I think this shows that the whelk, when it attacks its prey, seeks out for the part most suitable for its operation, and I believe invariably chooses a point from which the epidermis has been removed previously. A section of the bore, taken during the operation, shows that it is convex, and contradicts the received notion of the operation being performed by the action of the riband, which, being in the centre of the proboscis, would perforce wear the middle of the bore deepest; but this is not the case. The animal makes no movement of a rotatory kind or otherwise during the operation. It takes about two days to get through the shell, when it eats about two-thirds of a moderate sized mussel, which seems to satisfy hunger for about three weeks."

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* Peach in Annals Nat. Hist. vol. xi. p. 29.

This whelk is called Dog-periwinkle on many parts of the coast. It rarely lives below tide-marks; when it is so found, it is subject to great variation of form and sculpture, in some places becoming more elongated and thinner, in others having the furbelowed laminæ beautifully developed. It is indeed a most variable shell, and recent conchologists would do well to look at Plate IV. of Mr. Searles Wood's Monograph of Crag Mollusca, and see what strange modifications of form a single species may present. It is as variable in colour as in shape. It ranges all round the British shores, and extends, in the European seas, as far south as the north-west coast of Spain, though not continuously, so that its presence there is probably only as an outlier. It commenced to appear within our area during the red-crag epoch, and was probably diffused from the American side of the Atlantic. At present it inhabits both sides of the north Atlantic, and ranges through the Icy Seas.

NASSA. Lamarck.

Shell usually strong, ovate, rotund or Neritiform, always with a tumid body-whorl, variously sculptured, smooth, ribbed, decussated or striated, rarely with varices: spire acute or obtuse. Aperture ovate, with a short and constantly reflected, and as if truncated canal; outer lip often denticulated within, columellar lip reflected, often expanded and callous, and sometimes toothed. Operculum corneous, unguiculate, nucleus terminal.

Animal with a lunate not very broad head, bearing two long acute tentacula, filiform beyond the eyes, which are placed in the hind portions (united ommatophori), extending for about a third of their length; proboscis long, retractile, with corneous jaws, and a tongue armed with triple rows of teeth, of which the axile one is broad and sublunate, with numerous serrations, the laterals large and hamate. Mantle lax, produced into a long recurved siphon, which extends for a considerable distance beyond the canal of the shell. Foot extensive, expanded, oblong, truncated, and angulated in front, bifurcated at its posterior extremity. Branchial plumes, two. Male organ long, tapering, geniculate, reflected.

This extensive genus, abounding in pretty shells, the majority of which are of small dimensions, is one of the best marked and most easily recognised groups, both as to shell and animal, among the *Muricidæ*, though some conchologists strangely persist in mingling it with *Buccinum*. Its members have a wide range in depth, but the majority are inhabitants of the shallower zones. They are lively and active animals, and, when confined in vessels of sea-water, show themselves freely.

N. RETICULATA, Linnæus.

Whorls not rounded; mouth whitish; no labial varix; no dark spot at the canal.

Plate CVIII. fig. 1, 2, and (Animal) Plate L L. fig. 3.

Buccinum reticulatum, Linn. Syst. Nat. Hist. ed. 12, p. 1205. — PENN. Brit. Zool. ed. 4, vol. iv. p. 122, pl. 72, f. 92. — PULTENEY, Hutchins, Hist. Dorset, p. 42. — DONOV. Brit. Shells, vol. iii. pl. 76. — MONT. Test. Brit. vol. i. p. 240. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 137. — RACK. Dorset Catalog. p. 45, pl. 15, f. 10. — TURT. Conch. Diction. p. 14. — PEACH, Annals. Nat. Hist. vol. xiii. p. 203 (nidus); vol. xv. p. 446.—Brit. Marine Conch. p. 211. — BORN, Test. Mus. Vind. p. 260, pl. 9, f. 16. — SCHRÖT. Einleit. Conch. vol. i. pl. 2, f. 5.— DILLW. Recent Shells, vol. ii. p. 637 (not var.)—WOOD, Index Testac. pl. 23, f. 117.—LAM. Anim. s. Vert. (ed. Desh.) vol. x. p. 161. — BLAINV. Faune Franç. Moll. p. 172, pl. 7, a, f. 1; Man. Malacol. pl. 24, f. 2.— KIENER, Coq. Vivant. Buc. pl. 23, f. 91; transl. STORER, p. 65.—Encycl. Edin. pl. 203, f. 12.—DELLE CHIAJE, Poli, Test. Sicil. vol. iii. pt. 2, pl. 47, f. 1, 2.—PHILIPPI, Moll. Sicil. vol. i. p. 220; vol. ii. p. 188.

„ *pullus*, PENN, Brit. Zool. ed. 4, vol. iv. p. 118, pl. 72, f. 88 (young, teste authors).

„ *recurvirostrum reticulatum*, DA COSTA, Brit. Conch. p. 130, pl. 7, f. 10.

Nassa, &c. CHEMNITZ, Conch. Cab. vol. iv. p. 42, pl. 124, f. 1162.

Buccinum tessulatum, OLIVI, Zool. Adriat. p. 144.

Nassa reticulata, Fleming, Brit. Anim. p. 340.—Brown, Illust. Conch. G. B. p. 4, pl. 4, f. 22.—Lovén, Index Moll. Scandin. p. 14.
Tritonium reticulatum, Middend. Malac. Rossic. pt. 2, p. 175.

This abundant shell has an oval-conic shape, is thick, has but little lustre, and is of a very pale brown colour, becoming white towards the outer lip, the back of which is for the most part stained with two dark brown splotches like the commencement of a medial and a basal zone; a narrow fillet of bluish grey winds beneath the sutural line. Numerous convex pliciform ribs, that vary greatly as to number and approximation, but which, however straight and crowded elsewhere, generally become flexuous and rather distant towards the inner lip, uninterruptedly traverse the shell lengthways, and are decussated throughout (divided as it were into beads) by equidistant spiral sulci, of which there are four or five on the principal turns of the spire, and about thirteen or fourteen usually on the body-whorl. Of these grooves, which traverse ribs and intervals alike, that which runs over the coloured fillet is usually distinctly broader than the rest. The spire, which ends in a tolerably fine point, is composed of seven or eight tapering volutions; these, although only slightly and simply convex, are strongly defined; they are not very high, and of moderately rapid longitudinal increase. The body, which is moderately ventricose in the middle, vies with or slightly exceeds the spire in length; the broader it is the shorter does the spire become; the basal declination is gradual but convex. The mouth, which fills about one-half of the entire length, is somewhat oval, but is acutely contracted above, and ends below in a short and broadish canal.

A white enamel lines both lips, and occupies a moderate portion of the ventral side of the body; the throat, however, whose entrance is guarded on the right side by several (from eight to twelve generally) tubercular crenæ that are frequently produced into short spiral lyræ, or raised strings, often exhibits traces of the external colouring. The outer lip, which is solid, though not varicose, is bevelled to a sharpish edge; it is not much arcuated above, but is well rounded below, where, although not prickly, it is somewhat scalloped by the external sulci; when prominent — which is not usually the case—it is disposed to become patulous, otherwise it is simple. The canal tube or basal exposed portion of the columella is merely corded in a spiral direction. The pillar lip seems to vary as to its reflection; sometimes it stands almost erect, sometimes (and more generally) it is flatly appressed: the posterior pad, so usual in this genus, is almost obsolete. A few scattered inconspicuous nodulous elevations may be traced on the pillar lip. "The largest shells are an inch and a-half long, and nearly three-quarters wide at the base." (Mont.)

The animal is of a general yellowish hue, speckled with tawny and black, especially on the siphon, and mottled also with flaky ochraceous and white spots. The head is crescentic, with long acute filiform tentacula bearing the eyes on the thickenings at rather more than a third from their bases. The foot is broad and much expanded, reaching to the middle of the second whorl, anteriorly truncated with reflexed angles, posteriorly deeply emarginate and produced into two caudal filaments of moderate length, which, when the animal creeps, are reflected or borne upright. The operculum is somewhat lanceolate.

This species, which is generally distributed through the European seas, is too common around our shores to require an enumeration of its localities. It inhabits the verge of the littoral and the upper part of the laminarian zones. Its nidi, as observed by Mr. Peach, are compressed membranous capsules, shaped like the spade in playing cards, opening above, and borne on a short pedicle. They are usually deposited on the leaves of *Zostera*.

N. INCRASSATA, Müller.

Whorls rounded; a labial varix; mouth whitish, with a dark spot at the base of the canal.

Plate CVIII. fig. 3, 4, and (Animal) Plate L L. fig. 1.

Buccinum incrassatum, MÜLLER, Prodrom. Zool. Danic. (1776) p. 244 (from GUNNERUS, Acta Nidros. vol. iv. pl. 16, f. 25.)

„ *minutum*, PENN. Brit. Zool. ed. 4, vol. iv. p. 122 (badly) pl. 79, lower left hand fig. of central group.

„ *nanum*, GMELIN, Syst. Naturæ, p. 3497 (from CHEMN. Conch. Cab. vol. iv. pl. 125, f. 1176) probably.

„ *Ascanias*, BRUGUIERE, Encyl. Méth. Vers, vol. i. p. 275.—LAM. Anim. s. Vert. (ed. Desh.) vol. x. p. 173.—PHILIPPI, Moll. Sicil. vol. ii. p. 188.

„ *coccinella*, LAM. Anim. s. Vert. (ed. Desh.) vol. x. p. 176 (probably). —KIENER, Coq. Vivant. Bucc. pl. 20, f. 77, 78.

„ *Lacepedii*, PAYRAUD. Cat. Moll. Corse, p. 161, pl. 8, f. 13, 14 (fide Philippi).

„ *macula*, MONT. Test. Brit. vol. i. p. 241, pl. 8, f. 4. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 138, pl. 4, f. 4.— RACK. Dorset Catalog. p. 45, pl. 15, f. 8. — TURT. Conch. Diction. p. 15 (var. B ?) — Brit. Marine Conch. p. 217. — DILLW. Recent Shells, vol. i. p. 638. — WOOD, Index Testaceolog. pl. 23, f. 119.—BLAINV. Faune Franç. p. 174, pl. 6, c, f. 7, 8.—PAYRAUD. Cat. Moll. Corse, p. 157, pl. 7, f. 14.—COSTA, Test. Sicil. p. 80.

„ *riparium*, DELLE CHIAJE, Memorie Anim. s. Vert. vol. iii. pl. 48, f. 2, 3; Test. Sicil. vol. iii. pt. 2, p. 30, pl. 47, f. 12, 13.

Nassa incrassata, FLEMING, Brit. Ann. p. 340 (not var.).—JOHNSTON, Berwick. Club, vol. i. p. 238.—MACGILLIV. Moll. Aberd. p. 165.

Buccinum asperulum, PHILIPPI, Moll. Sicil. vol. i. p. 220.

Nassa macula, FORBES, Malac. Monens. p. 24, animal.—BROWN, Illust. Conch. G. B. p. 5, pl. 4, f. 23.

Buccinum incrassatum, Brit. Marine Conch. p. xlviii.

Buccinum breve? COUCH, Cornish Fauna, pt. 2, p. 64 (fry).—JOHNSTON, Berwick. Club, vol. i. p. 238 (from type).
Tritonium Ascanias, MIDDEND. Malacoz. Ross. pt. 2, p. 177.

The swollen penult volution of this solid little shell distinguishes it at once from the preceding; its coarser sculpture, paler aperture and anterior spot, render its discrimination from the succeeding species a task of equal easiness, even where it exhibits, as is exceptionally the case, a varix similar to the characteristic one of that shell.

It is more or less opaque, a little glossy, of a shape passing from oval-conical (the ordinary form) to ovate-acute (the stunted form), and of very variable painting. On the peculiarly broad and prominent white varix that strengthens the outer lip of the adult, and contracts the size of the aperture, are to be traced, though at times somewhat faintly, the commencement of three chestnut or brown sometimes interrupted bands, one at a little distance from the suture, one just below the middle, and the third one basal; of these, which do not always even traverse the body throughout (for sometimes the entire exterior, the varix excepted, is of an uniform brown or orange hue; the ground of the ordinary or banded variety is impure white) one or both of the upper ones wind, wholly or partially, round the spire, whose fine apex is sometimes purple. The more or less curved abruptly prominent fold-like ribs, that traverse the shell lengthways, and extend to the base of the body-whorl, are rendered somewhat nodulous by very numerous depressed spiral costellæ, which are so closely disposed, that the intervals at times seem mere sulci; the intervals of the ribs, which are also numerous, and have a tendency to dilate, in some specimens, below the middle of the smaller turns, are of moderate width, and often, indeed, are broader than the ribs themselves. The spire is about the length of the body-whorl, but more frequently surpasses, than is inferior to it, in length; it is composed of seven rounded turns that are divided from each other by a fine but strongly pronounced suture; the penult volution is more or less tumid, and of rapid longitudinal increase. The body-whorl is rather broad for its length, and moderately ventricose; its basal declination is convex, and not particularly sudden; a deep and abrupt groove severs it from the very short recurved whitish canal, which latter is stained internally with chocolate-brown. The aperture, which in mature examples is very small for the size of the shell (yet the outer lip itself, for the varix rises a little above the body, occupies from two-fifths to almost half the entire length) is of a suborbicular or rounded oval shape, is contracted, but not acutely so, above by the slight projection of the base of the penult whorl into the mouth, and terminates anteriorly in a short and abruptly oblique narrow canal. Both lips are white or pale yellow; the enamel is not very thickly spread or widely diffused upon the body; there is a more or less distinct narrow pad on the inner lip, at the upper corner of the aperture. The throat, which usually participates more or less in the external colouring, but is sometimes whitish, sometimes of a livid purplish tint, is guarded at its entrance, on the right, by about half a dozen tubercular crenæ. The outer lip, though solid, is bevelled to a fine edge; it is moderately prominent above, well arcuated and not prickly below. More or less perceptible, somewhat horizontal, raised corrugations cross the pillar lip, which latter is straightish, very solid, and appressly reflected. The columella is simply corded in a spiral direction. Our largest example measured two-thirds of an inch in length, and about half as much in breadth.

The animal is white, speckled with brown, and sometimes with black, most strongly so at the head and siphon. The head is crescentic with linear acute tentacula, bearing the eyes on thickened portions at a third of their length: the anterior angles of the foot are shortly recurved; its caudal extremity is very shortly bifurcated, almost as if notched, and just above the furcations are two cirri, or short processes. The operculum is somewhat pyriform and broader than in *pygmæa*. According to Lovén, the axile tooth of the tongue is of more ample proportional dimensions than in *reticulata*, and the broad hamate uncini have a denticular process near their bases externally.

This shell is so universally and abundantly diffused around the British shores, that an enumeration of localities would be superfluous. It ranges from near low-water-mark to as deep as fifty fathoms, preferring stony and gravelly ground. Its colours are most brilliantly displayed in southern examples. A variety, with a white varix on the centre of the whorl, has been found by Mr. Alder at Whitburn, and by Mr. Barlee in Galway. It is a Celtic Mollusk in the main, but ranges northwards to the Arctic Circle, and southwards to Madeira. It is found fossil in the red crag, and in the glacial drift.

N. PYGMÆA, Lamarck.

Outer lip thickened by an external varix; mouth more or less stained with purplish red; dorsal edge of the canal not spotted with blackish brown.

Plate CVIII. fig. 5, 6, and (Animal) Plate L L. fig. 2 (as *varicosa*.)

Buccinum reticulatum, purple-mouthed, var. MONT. TEST. Brit. vol. i. p. 241?
Ranella pygmæa, LAM. (1822) Anim. s. Vert. (ed. Desh.) vol. ix. p. 550.—BLAINV. Faune Franç. Moll. p. 121, pl. 4, c. f. 3.—DESHAYES, Encyclop. Méthod. Vers, vol. iii. p. 881.—KIENER, Coq. Vivant. Ranel. p. 33, pl. 10, f. 2.

Buccinum tuberculatum, Turton, Conch. Diction. p. 16 (teste Jeffreys from type).
Tritonia varicosa, Turton, Zool. Journ. vol. ii. p. 365, pl. 13, f. 7.
Nassa incrassata, var. Fleming, Brit. Anim. p. 340.
Buccinum incrassatum, var. Brit. Marine Conch. f. 47.
Nassa varicosa, Brown, Illust. Conch. G. B. p. 5, pl. 4, f. 24.

It is strange that a shell so well marked in its characters should not have been distinguished as a species by the earlier British writers: it appears to have been passed over as a variety of the preceding species.

The shell is oval-conic, not very thick, never shining, often semitransparent, and painted on a dirty ochraceous or mud-coloured ground, with a dark livid very narrow fillet that winds below the suture; besides which two or three rarely entire (or uninterrupted) pale chestnut bands (one basal, one medial, and the third, which is rarely visible, between the last and the infrasutural dusky line) partially encircle the body, but are chiefly evident on the few solid riblike white varices, which at irregular intervals (two at most on each turn; indeed the labial varix is occasionally the sole one) protrude from the general surface. Numerous, but not crowded, narrow longitudinal ribs (they vary as to number, but twelve at least appear on each larger volution) are somewhat cancellately decussated by more closely disposed spiral costellæ, of which last there are somewhere about ten rows on the body, four or five of which are continued upon the smaller turns: their intersectional points are slightly nodulous. The sharply pointed spire is composed of seven or eight short whorls, that increase rather quickly in length, are simply convex (not ventricose), taper rather quickly above, and are deeply divided by the not much slanting sutural line. The body is moderately ventricose, and decidedly, though not considerably, shorter than the spire: its basal declination is somewhat abrupt, but well rounded. From two-fifths to three-sevenths of the ventral length is filled by the small mouth, which is more or less stained with livid purplish red, especially on the inner lip, and at the edges of the short canal, which last is never painted with the dusky dorsal blotch that characterises the preceding shell. The outer lip, which is strengthened by an external varix, arches out boldly from the body, and sweeps in a continuous rounded curve to the anterior extremity; its inner edge is armed with several small tubercular crenæ. The inner lip is deeply incurved in the middle; its enamel is not very widely diffused, and is usually rather thinly spread: the pillar lip is almost appressed, and is studded below with two or three horizontally compressed granules. Fair-sized examples are usually six lines and a half long, and a quarter of an inch broad.

The animal is similar in colour with that of *incrassata*, but differs conspicuously in having longer and more slender tentacula, a rather longer siphonal tube, the anteal angles of the foot larger and more recurved, and above all, instead of very short caudal processes, in this species these organs are considerably developed, filiform, and diverging.

We have dredged it abundantly at Torbay and Weymouth; our Devon specimens, by far the finest, from a pure sandy bottom at only from four to five fathoms; our Dorset, more solid, and intensely coloured from a rubbly bottom of more than twice that depth (S. H.) The animal figured was taken in twelve fathoms off Dartmouth (E. F.) Mr. Clark has taken it at Exmouth, and Mrs. Richard Smith at Teignmouth (Jeffreys). Falmouth (Cocks). It is essentially a southern and Lusitanian form. A varicose variety of *incrassata* has been occasionally confounded with it, and led to the belief that it occurred in the north of Britain.

SPURIOUS.

N. LINEATA, Pulteney.

Nassa, &c. MARTINI, Conch. Cabinet, vol. iv. pl. 125, f. 1186, 1187.
Buccinum recurvirostrum lineatum, DA COSTA, Brit. Conch. p. 130, pl. 8, f. 5.
„ *strigosum, var. δ.* GMELIN, Syst. Naturæ, p. 3488 (from Martini).
„ *lineatum*, PULTENEY (not Gmelin), Hutchins, Hist. Dorset, p. 41.—DONOV. Brit. Shells, vol. i. pl. 15. — MONT. Test. Brit. vol. ii. p. 245. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 135.—RACK. Dorset Catalog. p. 45, pl. 14, f. 5. —TURT. Conch. Diction. p. 17.—FLEMING, Brit. Animals, p. 344. — Brit. Marine Conch. p. 216. — DILLW. Recent Shells, vol. ii. p. 626.—WOOD, Index Testaceolog. pl. 23, f. 92.
„ *pediculare*, LAMARCK, Anim. s. Vert. (ed. Desh.) vol. x. p. 177.—KIENER, Coq. Vivant. Bucc. p. 72, pl. 25, f. 102 ; transl. Storer, p. 70.—HANL. Young Conch. p. 109.
Planaxis lineata, THOMPSON, Annals Nat. Hist. vol. xiii. p. 433 ; Brit. Associat. Report, 1842, p. 256.

A most abundant West Indian shell, introduced by Da Costa as from Cornwall.

N. AMBIGUA, Pulteney.

Buccinum ambiguum, PULTENEY, Hutchins, Hist. Dorset, p. 42.—MONT. Test. Brit. vol. ii. pp. 242, 585, pl. 9, f. 7.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 138, pl. 4, f. 5.—RACK. Dorset Catalog. p. 45, pl. 18, f. 19.* — TURT. Conch. Diction. p. 15.—Brit. Marine Conch. p. 218.— DILLW. Recent Shells, vol. ii, p. 638.—WOOD, Index Testaceolog. pl. 23, f. 118.—KIENER, Coq. Vivant. Buccin. p. 14, pl. 21, f. 81 ; trans. Storer, p. 81.—HANL. Young Conch. p. 108.
Nassa ambigua, FLEMING, Brit. Animals, p. 340.—BROWN, Illust. Conch. G. B. p. 5. pl. 4, f. 20, 21.

A West Indian shell, introduced by Pulteney as from the Dorset coast.

N. HEPATICA, Montagu.

Buccinum hepaticum, PULTENEY, Hutchins, Hist. Dorset, p. 41.—MONT. Test. Brit. vol. ii. p. 243, pl. 8, f. 1.—MATON and RACK.

Trans. Linn. Soc. vol. viii. p. 135.—RACK. Dorset Catalog. p. 44, pl. 15, f. 13.—TURT. Conch. Diction. p. 17.—Brit. Marine Conch. p. 216.—DILLW. Recent Shells, vol. ii. 604.—WOOD, Index Testac. pl. 22, f. 42.

Monoceros hepaticus, FLEMING, Brit. Animals, p. 342.

Buccinum monile, KIENER, Coq. Vivant. Bucc. p. 68, pl. 11, f. 40; transl. Storer. p. 66?

„ *Jacksonianum*, KIENER, Coq. Vivant. Bucc. p. 64, pl. 19, f. 73; transl. Storer, p. 63?

Nassa hepatica, BROWN, Illust. Conch. G. B. p. 5, pl. 4, f. 19.

Oval-conic, strong, shining, indistinctly zoned with olive and pale fulvous (more rarely and chiefly when worn or young, with whitish and chestnut brown), the darker colouring, chiefly present on the body-whorl, in three bands, of which the middle one is moderately broad, and most conspicuous, the infrasutural one is, at the least, equally as broad, but less defined, and only separated from the former by a pale narrow fillet, whilst the basal is hardly visible till the shell is held up to the light: the penult whorl olivaceous with a paler spiral fillet; the rest of the turns are more or less light coloured. A narrow retuse or indented area runs beneath the fine suture; and is studded at the top with small isolated nodules that are not in the same line with the longitudinal ribs with which the remainder of the surface is adorned. These last, generally about fourteen or fifteen on each of the larger turns, are usually somewhat flexuous and oblique upon the body, and much narrower than their intervals; the reverse holds good upon the apical coils. Two strongly incised spiral lines (occasionally a third obscure one above them) wind round the base of the body-whorl, which, as well as the principal turns of the spire, is otherwise free from spiral sculpture. The spire, which tapers to a very fine point, is composed of seven or eight volutions, the lower one of which (whose breadth to its length is usually as five to three) is about equal in height to the rest united. They are of rather fast longitudinal increase, not much rounded; and, at least, the lower ones, subangulated above. The body, which fills about four-sevenths of the dorsal length, is moderately broad, but not ventricose, the surface being merely convex; the basal attenuation is inconsiderable, and the basal declination very gradual: the very short beak, whose spiral sulci are few in number, is not spotted internally. The aperture is rounded oval, with its symmetry disturbed above by the prominence of the posterior pliciform pad; it ends below in a short canal. Both lips are white. The outer one is convex above, arcuated below, strengthened externally, armed at the edge with a few anterior sharpish denticles, and guarded within by numerous raised spiral lines. The inner lip is much incurved, and has only a few obscure pimple-like elevations near the base. The callus or enamel is not very broadly spread upon the body. Length nearly an inch; breadth fully half an inch.

A not uncommon species, of which we have seen examples from the Philippine Islands (Cuming), &c.; it was introduced into our Fauna as dredged at Weymouth! Montagu, whose description of it is excellent, states that he had received it from Dr. Pulteney, in whose Catalogue of the Shells, &c. of Dorset it was first indicated as British. RACKETT, *who copied the diagnosis in his second edition of the same scarce work (p.* 44) *has figured a very different shell (pl.* 15, *f.* 13) *which looks more like a worn shell of the* N. reticulata, var. paucicostata (*Kiener, Coq. Viv. Bucc. pl.* 19, *f.* 7), *of which we have seen an example, of questionable indigenousness, once owned by Mrs. Loscombe.*

BUCCINUM. LINNÆUS.

Shell ovate, more or less ventricose, turreted, surface smooth or spirally striated, spirally grooved or longitudinally plicated, invested with an epidermis. Aperture ovate, emarginate, or very shortly canaliculated below, canal wide, truncated, dorsally more or less tumid; columella smooth, inner lip expanded, outer lip usually thin and smooth within. Operculum corneous, oblong, its nucleus lateral.

Animal bulky, head broad, depressed, bearing two somewhat flattened tentacula, set well apart, their tips subulate, their bases thickened for half their lengths by the connate sustentacula, which bear the rather small eyes; proboscis ample; tongue armed with teeth, ranged three in a row, the axile one broad and quadrate, with many crenations, the laterals scythe-shaped, with denticulated bases. Male organ very large, sickle-shaped.

We retain the old name *Buccinum*, originally applied to whelks in general, for that group of shells, of which the common *Buccinum undatum* may be regarded as the type. They constitute a very natural assemblage, though one of no great extent, and are mainly inhabitants of the boreal and arctic regions of both northern and southern hemispheres. The relation of the distribution of this form of Mollusk to climate is strikingly shown when we compare such a shell as the *Buccinum cyaneum* of Greenland, with the *Buccinum antarcticum* of the Falkland Islands, one of the most striking instances that can be cited of the representation of species by similar species in regions far apart, but subject to similar physical conditions.

Several zoologists have of late united the *Buccinum undatum* and its allies with *Fusus antiquus*, and similar shells, under the old generic name of *Tritonium*, originally proposed by Otho Frederic Müller. Independent of the very serious objection which applied to this name on account of its having become obsolete, whilst the too similar word *Triton*, and even *Tritonium* itself, were used in the meantime for a very different assemblage of *Muricidæ*, and one presenting good natural marks of distinction, we are inclined still, provisionally at least, to keep up the distinction between the *Fusi* of the north and *Buccinum*, since shell, animal, and operculum, present marks of distinction, which, though in the end they may prove to be of no more than sectional value, yet in the present state of our knowledge deserve to be considered of importance.

Unfortunately the name *Buccinum* has even of very late years been applied to such a heterogeneous assemblage of shells that it is difficult to disentangle those to which we restrict the name from a number of very different forms having no true generic affinity with them.

These mollusks appear to have commenced their existence during the later tertiary epoch. At present they have the power of enduring very variable conditions of depth and locality, though the geographic range of the group is limited, however widely may extend the areas of some species.

B. UNDATUM, Linnæus.

With more or less coarse spiral striæ, and usually with broad longitudinal folds; beak short.

Plate CIX. fig. 3, 4, 5, CX. fig. 4, and (Animal) Plate L. L. fig. 5.

LIST. Anim. Angl. pl. 3, f. 2, 3; Hist. Conch. pl. 962, f. 14, 15. — SEBA, Museum, pl. 39, f. 77, 78, 79. — KNORR, Délices des Yeux, pt. 4, pl. 19, f. 1.—Encycl. Méth. Vers, pl. 399, f. 1.

Buccinum undatum, LINN. Syst. Nat. ed. 12, p. 1204.—PENN. Brit. Zool. ed. 4, vol. iv. p. 121, pl. 73, f. 90.—PULTENEY, Hutchins, Hist. Dorset, p. 42. — DONOV. Brit. Shells, vol. iii. pl. 104. — MONT. Test. Brit. vol. i. p. 327. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 137.—RACK. Dorset Catalog. p. 45, pl. 17, f. 6. — TURT. Conch. Diction. p. 12. — FLEMING, Brit. Anim. p. 342.—FORBES, Malac. Monens. p. 60.—COUCH, Cornish Fauna, pt. 2, p. 63.—JOHNSTON, Berwick. Club, vol. i. p. 237.—MACGILLIV. Moll. Aberd. p. 162. — Brit. Marine Conch. p. 214. — BROWN, Illust. Conch. G. B. p. 4, pl. 3, f. 1, pl. 4, f. 8, 9, 10. — KING, Annals Nat. Hist. vol. xviii. p. 248, and vol. xix. p. 347. —HANCOCK, Ann. Nat. Hist. vol. xix. p. 150.—ALDER, Cat. Moll. Northumb. and Durh. p. 66.—MARTINI, Conch. Cab. vol. iv. pl. 126, f. 1206, 1207, 1208, 1209. — BORN, Test. Mus. Vind. p. 259, pl. 9, f. 14, 15. — BROOKES, Introd. Conch. f. 79. — DILLW. Recent Shells, vol. ii. p. 632, chiefly. — WOOD, Index Testaceolog. pl. 23, f. 107.—LAM. Anim. s. Vert. (ed. Desh.) vol. x. p. 154.

—Blainv. Man. Malacol. pl. 22, f. 4; Faune Franç. Moll. p. 169, pl. 6, c., f. 2, 3.—Sowerby, Genera Shells. Bucc. f. 1, 2. — Kiener, Coq. Vivant. Bucc. p. 3, pl. 2, f. 5; transl. Storer, p. 3.—Sowerby (Jun.), Conch. Man. f. 421.—Swainson, Malacology, f. 71, c., at p. 301.—Gould, Invert. Massach. p. 305. — Dekay, New York Moll. p. 130, f. 161.—Cuvier, Règne Anim. (ed. Croch.) pl. 53, f. 1.—Reeve, Conch. Icon. vol. iii. Buc. pl. 1, f. 3.

Buccinum striatum, Penn. Brit. Zool. ed. 4, vol. iv. p. 121, pl. 74, f. 91.

„ *canaliculatum*, *vulgare*, Da Costa, Brit. Conch. p. 122, pl. 6, f. 6.

Tritonium undatum, Müller, Zool. Danic. pl. 50.—Middend. Malac. Ross. pt. 2, p. 151, pl. 4. f. 1, 2, 3.

Buccinum Bornianum, Chemnitz, Conch. Cab. vol. ix. p. 57, pl. 105, f. 892, 893 (from Born, Test. pl. 9, f. 14, 15) sinistral.

„ *carinatum*, (not of Phipps, Gmel. Dillw.) Turt. Conch. Diction. p. 13, f. 94, from which Fleming, Brit. Anim. p. 343, and Blainv. Faune Franç. Moll. p. 171 (deformed).—Brown, Ill. Conch. G. B. p. 126, pl. 57, upper f. 18.

„ *acuminatum* (abnormal variety), Broderip, Zoolog. Journ. vol. v. (1830), p. 44, pl. 3, f. 1, 2. — Brit. Marine Conch. p. 215.—Brown, Ill. Conch. G. B. p. 4, pl. 3, f. 5, 6. —Reeve, Conch. Icon. vol. iii. Buc. pl. 1, f. 4.

„ *Anglicanum*, Fleming, Brit. Animals, p. 243.—Macgilliv. Moll. Aberd. p. 164. — Brown, Ill. Conch. G. B. p. 4, pl. 4, f. 11; and pl. 3, f. 2, 3.

„ *from Zetland*, Forbes, Mag. Nat. Hist. vol. viii. p. 593, f. 62.

„ *Labradorense*, Reeve, Conch. Icon. vol. iii. Buc. pl. 1, f. 5.

„ *imperiale*, Reeve, Conch. Icon. vol. iii. Buc. pl. 2, f. 8 (deformed).

„ *pyramidale*, Reeve, Conch. Icon. vol. iii. pl. 13, f. 104.

Tritonium Humphreysianum, Lovén, Index Moll. Scand. p. 12 (from specimen).

Murex undatus. Clark, Annals Nat. Hist. 2nd Series, vol. vii. p. 114.

Buccinum tenerum (Fossil), Sow. Min. Conch. pl. 486, f. 3.

The common whelk is one of the most variable of Atlantic shells, as well as one of the most widely distributed, and is not the less interesting on either account. Its general outline is ovato-conical, passing through various degrees of elongation, from a short, squat, ventricose shell to one remarkable for slenderness and graceful curvature. These differences in contour may depend on the greater or less ventricosity of the body-whorl, or on the degree of production of the spire. The number of whorls in all the forms is about six, seven, or eight. They may be variously rounded, and are very rarely flattened; they are always spirally and minutely striated, and usually more or less conspicuously spirally grooved as well; in the most typical examples, all the whorls exhibit tranverse undulations, few or many, weak or strong, always oblique and obtuse, crossing one half or two-thirds of the sutural side of the body-whorl, and the whole breadth of the upper whorls; in other forms these become entirely obsolete on the body-whorl, and evanescent on the spire. The aperture of the shell presents constant characters. It occupies two-thirds of the length of the body-whorl, its upper angle uniting with the latter just below the greatest tumidity of the body. It is always ovate and ample; its outer lip thickened, sinuated, and sub-reflexed above, projecting and patulous below, where it retires and becomes sinuated and somewhat reflected to form the very short and wide canal. The pillar lip is concave and twice sinuated and obliquely contorted on the columella, over which it forms a polished expansion; at its extremity it is truncated, with a slight obliquity to form the inner wall of the siphonal canal; dorsally, the convexity of its upper sinuation is continued as a strong, rounded, oblique fold, to the truncated notch of the canal. The surface of the shell is usually invested with an epidermis, often soft and pilose, sometimes glabrous and membranous, less frequently altogether wanting. Its colour varies, being white, or yellowish, or brownish, without bands, or of the same ground-colours, with chestnut spiral bands, or wavy blotches. A variety occurs with chestnut bands, alternating with broad white intermediate spaces. The interior of the mouth also varies from pure white to yellow, and various degrees of intensity of purple.

The varieties of this species have received especial attention from Professor King, Mr. Albany Hancock, Mr. Howse, and other naturalists, to whose papers we must refer for details of greater length than can be included in our space. Within the littoral zone, usually at its lowest verge, and mostly on the northern coasts, extending its range sometimes into the laminarian zone, is the smallest form, that to which the term *littorale* has been applied. It lives equally on mud, sand, and rock, and we have met with it abundantly on all these grounds in the Frith of Forth. It is a ventricose dwarf shell, with a short spire, sometimes strong, sometimes thin, undulated, or without undulations; in the former case usually living on rocks or hard shores, and then its surface is without an epidermis; in the latter, living on sand or mud, and having an epidermis, which is frequently highly pilose. In deeper water, ranging from the middle of the laminarian zone to as deep as thirty or more fathoms, where the ground is hard or roughish we find a very strong, often ponderous shell, with prominent and often angulated undulations, and the surface unprotected by an epidermis. This is the variety *crassum* of King, who mentions his observation of its passage into his variety *magnum*. The spire is moderately produced, the spiral sulcations strongly marked, and the colour of its aperture usually white. The variety into which it passes has the epidermis more or less developed and often quite glabrous, the substance not so thick, and the undulations not so strongly marked, diminishing in intensity, indeed, until at length, usually in comparatively thick shells, they disappear entirely on the body-whorl, when we have the *striatum* of Pennant, a form which is common, and grows to a large size on the scallop banks off the north of the Isle of Man. This second form is the var. 2 of Hancock. In deep water, from forty fathoms, or thereabouts, downwards to eighty, is a third principal variety, in the main a thinner and slenderer shell with rounded volutions, more delicately sculptured, and covered with a soft pilose epidermis; the aperture yellowish or tinged with purple. The undulations are not so strongly marked as in the former variety, and even in specimens of considerable dimensions, the whole texture is lighter and thinner. The body-whorl is ample in its tumidity, although the spire be produced. This is var. 1 of Alder and Hancock, *pelagicum* of King. The distinctions drawn by these gentlemen from Northumberland specimens are very important, as we have had an opportunity of seeing when examining northern collections, among others a very full series collected with much care by Mr. Embleton of Embleton.

Still more produced, is a variety not uncommon in deep water in the Zetland seas and off the Hebrides, a form which approaches in outline and elongation the *B. fusiforme.* It inhabits deep water, and exhibits two variations, the one with a purple aperture, nearly ribless whorls, and a moderately thin shell, covered by an epidermis; the other with a stronger shell, well marked undulations, banded colouring, and a white or yellowish aperture. This last is the *forma elatior* of Middendorff.

The remarkable shell described and figured by Broderip as *B. acuminatum*, and now contained in the collection at the British Museum, appears to us to be an abnormal variety of *undatum*, with very flattened whorls, and consequently an imperfectly angulated base. Of other abnormalities, or rather distortions, we are acquainted with a reversed form; another having a very ventricose body-whorl and a short spire, the whorls of which are carinated; an extremely elongated shell with strong ribs and no epidermis, but remarkable for having a groove encircling the upper part of the body-whorl. The two last are in Mr. Alder's collection.

Mr. Jeffreys has a carinated form from the mouth of the Thames procured by Mr. Sowerby, a pleurotomatous monster taken by Mr. Barlee on the west of Scotland, and a scalariform *lusus* taken off South Devon.

Buccinum undatum varies considerably in colour through various shades of plain white, to a general purple tint, or chestnut banded on a white ground, or blotched with brown, or entirely brown. It grows to the size of six inches long by three wide.

The general colour of the animal is yellowish white, sometimes with a tinge of tawny, and usually mottled with irregular blotchings, or specklings of black, which are especially conspicuous on the sides of the foot, head, tentacula, and siphon. The head is broad, rather small in proportion to the body, and flanked by two lanceolate, flattened, rather obtuse tentacula, with thickened and widened bases, on which on bulgings, externally, are borne the blue-black eyes: the tentacula are distinctly separated from each other by a frontal slightly bilobed space. The siphon is long, and recurved when exserted. The male organ is massive, very large, elongato-pyriform, with a short lanceolate mucro on its upper extremity; the foot is vast, when creeping much expanded, obscurely truncated in front, rounded behind, and bearing the operculum on a rounded lobe without process. The operculum is strong, corneous, brownish yellow, and composed of subconcentric elements round a sublateral nucleus. The proboscis is long and ample; the axile tongue-teeth are broad and serrated, with many denticles below; the denticular processes of the lateral teeth are few, large, and strong; their limb narrow and blade-shaped. The nidus is a rounded mass of wrinkled cartilaginous vesicles, each containing usually two or four young ones, packed alternately in opposite directions.

The common whelk is universally distributed around the British shores, varying, however, greatly in its characters according to locality. It is collected and taken in lobster-creels, or baskets for bait or food; great numbers are constantly exposed for sale in London, simply boiled, to be eaten with a little vinegar and pepper; a poor man's delicacy, but by no means a wholesome morsel. Dr. Johnston mentions that at the enthronization feast of William Warham, Archbishop of Canterbury, in 1504, no fewer than eight thousand whelks were supplied, at five shillings for a thousand.

This species first appeared in the British seas during the age of the coralline crag, and persisted through all succeeding epochs, becoming more and more abundant. It is found from low-water-mark to as deep as one hundred fathoms. It has a wide latitudinal range, now extending throughout the Celtic, Boreal, Arctic and Icy seas, and along the coast of Boreal America, from Cape Cod to Greenland. According to Middendorff, it finds its way through the Siberian seas into the Sea of Ochotsk. This great range in time and space accords with its capacity for variation and adaptation to circumstances. During the pleistocene epoch it had found its way into the Mediterranean, and occurs fossil in the Sicilian newer pliocene beds, but is now extinct in that region.

B. Dalei, J. Sowerby.

Polished white, smooth to the eye, never with folds; body half as long again as the spire.

Plate CIX. fig. 1, 2.

Buccinum Dalei, (Fossil) J. Sow. Min. Conch. pl. 486, f. 1, 2.—S. Wood, Crag Moll. p. 34, pl. 3, f. 10.

" *ovum*, Turton, Zoolog. Journ. vol. ii. p. 366, pl. 13, f. 9.—Fleming, Brit. Anim. p. 343.—Brit. Marine Conch. p. 215.—Brown, Illust. Conch. G. B. p. 4, pl. 4, f. 15.—King, Ann. Nat. Hist. vol. xix. p. 340.—Alder, Cat. Moll. Northumb. and Durh. p. 67.—Blainv. Faune Franç. Moll. p. 172.—Reeve, Conch. Icon. vol. iii. Buccin. pl. 4, f. 25.

,, *fusiforme*, Kiener, Coq. Vivant. Buccin. p. 5, pl. 5, f. 12; transl. Storer, p. 6 (probably).

Halia Flemingiana, Macgilliv. Moll. Aberd. p. 189, copied, Brown, Illust. Conch. G. B. p. 132 (Young, teste Jeffreys, from type).

Tritonium ovum, Middend. Malacoz. Rossica, pt. 2, p. 174, pl. 4, f, f. 12, and pl. 6, f. 1 to 4?

This shell, whose form is rather obliquely subovate, being somewhat rounded and moderately broad below, and tapering rather quickly above to a very blunt apex, is not so strong as most of its genus, a little translucent, very glossy, and of an uniform ivory white that is obscurely stained with pale yellowish streaks at the stages of increase. The epidermis has a greenish hue (King). Not the slightest vestiges of any folds are perceptible beneath the very fine and but little oblique suture; but the surface, although smooth to the eye, is seen, when closely examined, to be most obscurely striated with minute spiral lines. The spire, the apical coils of which are symmetrical and greatly depressed, only fills about one-third of the dorsal length; it is composed of five simply but much rounded quickly increasing volutions that taper above, whereof the penult is not much more than half as high as it is wide. The basal declination of the body-whorl, which is ventricose or even tumid, is moderately rapid, and much rounded. The pure white aperture, which is totally devoid of all sculpture (it has not the columellar fold of *ciliatum* to which in some respects it is allied), occupies about four-sevenths of the ventral length; it is of a sub-rhomboid-oval figure, contracted above to a curved acute angle, and but little narrowed below until the formation of a short and remarkably wide canal, that bends to the left. The more or less prominently arcuated outer lip (the swell being continued almost to the anterior extremity) does not exhibit any posterior sinuation, recedes moderately below, and is somewhat patulous, the edge being acute, and very gently reflected; this reflection produces the appearance of an abbreviately recurved beak at the basal emargination. The enamel of the inner lip is more apparent from its brilliant whiteness than its solidity. The upper part of the inner lip swells into the aperture, and forms an obtuse angle with the columella, which scarcely, if at all, exceeds it in length (being shorter than the outer lip), is rounded, rather broad, and straightish, but much curved at the anterior extremity. The pillar lip is appressly reflected. The beautiful specimen we have figured from Mr. Jeffreys' collection measures twenty lines in length, and thirteen in breadth.

The animal is unknown. The shell is very rare; it is marked in Turton's collection as from Torbay, and we venture to hazard a conjecture that it found its way to that quarter through the agency of Newfoundland fishermen. The species is, however, unquestionably British, though exceedingly rare, having been procured by Mr. Humphreys from the stomach of a haddock caught off Cork, by Mr. King, from the Dogger Bank, off the Northumberland coast, and by Mr. Macgillivray off Aberdeen. It probably lingers, the individuals few and far between, on the boreal outlines of our seas, the relicts of an ancient fauna; for, though rare in the coralline, it was abundant in the red crag seas. It is now chiefly an inhabitant of the icy seas, and ranges from Greenland to Behring's Straits.

B. Humphreysianum, Bennett.

Faintly variegated, almost smooth, never with folds; body longer than the spire.

Plate CX. fig. 1.

Buccinum Humphreysianum,	Benn. Zool. Journ. vol. i. p. 398, pl. 22, top figures.—Brit. Marine Conch. p. 215.—Brown, Illust. Conch. G. B. p. 4, pl. 4, f. 14.—Bullet. Sciences Nat. vol. vii. p. 259.
Tritonium ,,	Middend. Malac. Rossica, pt. 2, p. 163 ?

This rare and elegant *Buccinum* has an oval-acute figure is more or less thin, a little transparent, and of a pure and delicate creamy flesh or very pale fawn colour, on which are painted, though often obscurely, various wavy markings of brown or fulvous. These which upon the spire are usually arranged lengthways in flexuous streaks, seem disposed upon the body in spiral bands, of which there seem two narrow twin ones, one basal, one inframedial, besides a broader upper one (perhaps composed of two confluent ones), on which they sometimes form an irregular kind of network. The surface does not exhibit the slightest trace of riblike undulations, but is most closely encircled with fine sulci (whose intervals are scarcely broader), and crossed lengthways, at least on the principal turns, by most minute regular close-set lines, that beneath a powerful lens are perceptibly, though very slightly elevated. No substantial angularity or retusion disturbs the simple roundness of the volutions, which are seven or eight in number, moderately ventricose, taper above, are of tolerably fast longitudinal increase, end in a very blunt apex, and are divided from each other by a simple yet strongly pronounced suture. The spire is somewhat exceeded in length by the much rounded body-whorl, which is gradual but very convex in its basal declination, and ends anteriorly in a rather projecting and gently recurved short canal. The mouth occupies about one-half of the entire length, is acutely subovate, sharply contracted above, nearly twice as long as broad, is flesh or horn-coloured, and devoid of all sculpture whatsoever. The posterior enamel of the inner lip appears to be but thinly spread, but this probably depends on local circumstances. The outer lip is moderately prominent, slightly thickened and reflected at the margin, greatly arcuated somewhat receding anteriorly; the edge itself is a little incurved or retuse in the middle. The body swells out above into the mouth; the rest of the columellar lip is tolerably straight, as the medial concavity is but trifling. There is not the faintest indication of any axial perforation. The shell is said to attain to two inches in length, and one inch in breadth, a size superior to the dimensions of any example we remember to have examined.*

The animal is unknown. Like the last species, this appears to be an arctic form lingering in our fauna. It was found off Bearhaven, Cork harbour, by Mr. Humphreys, and has been taken off Skye by Mr. Barlee. Mr. Jeffreys informs us that it was taken in Bantry Bay by Mrs. Puxley and Dr. Armstrong.

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* Although the extreme rarity of this shell prevents us from tracing the links, it is by no means impossible that it may form one species with the *B. ciliatum* of Gould, Inv. Mass. p. 307, f. 209 (as of O. Fabric.) from which Dekay, New York Moll. p. 134.—Reeve, Conch. Icon. vol. iii. Buc. pl. 1, f. 1, from *B. ventricosum*, Kiener, Coq. Viv. pl. 3, f. 7.

B. FUSIFORME, Broderip.

Oblong-subfusiform, pure white, decussated by narrow, longitudinal ribs and spiral costellæ: beak rather long, recurved.

Plate CX. fig. 2, 3.

Buccinum fusiforme, BROD. (not KIENER) Zool. Journ. vol. v. p. 45, pl. 3, f. 3.—Brit. Marine Conch. p. 216.—BROWN, Illust. Conch. G. B. p. 4, pl. 3, f. 4.—REEVE, Conch. Icon. vol. iii. Buc. pl. 5, f. 31.

Fusus fenestratus, TURTON, Mag. Nat. Hist. vol. vii. p. 351; copied, Brit. Marine Conch. p. 207.

This shell, which has an oblong subfusiform shape that is more produced and tapering above than below, is clothed with a dirty olivaceous yellow epidermis, beneath which it is moderately strong, nearly opaque, and of an uniform white. The very numerous narrow rib-like folds that traverse the shell lengthways, but do not extend to the lower half of the body-whorl, and usually cease towards the outer lip, are somewhat nodulosely decussated by very close-set spiral costellæ, which become more prominent and sharply defined on the base of the shell. Of the former, which are slightly but regularly arcuated, and are separated by intervals that are as wide or wider than themselves, we counted about twenty on the penult volution of the delineated example, where seven or eight of the latter were also present. The spire, which exceeds the body in length, and ends in a small and apparently blunt point, is composed of nearly seven turns, that are of slow longitudinal increase, and merely separated by a simple suture; they are nevertheless very clearly defined from the abruptness with which they swell out from the divisional line, near which they evince a slight disposition to horizontal flatness: the penult turn is about twice as broad as it is long. The body is peculiarly rounded above, and rather contracted below, where it ends in a recurved beak that is rather long for the genus *Buccinum.* There is no vestige of any axial perforation. The mouth is pure white, totally devoid of sculpture, fills about three-sevenths of the ventral length, and is of a rather narrow pear-shape, yet a little angular above, and much attenuated anteriorly, where the broad canal bends slightly to the left. The outer lip, whose marginal contour is concave in the middle, is acute, simply but considerably arcuated, yet not peculiarly prominent. The course of the inner lip is sinuous; it is much incurved above, then convex, and finally slants to the left, in nearly a straight line. Just before the commencement of the canal the pillar is convex and rather broad, elsewhere it is flattish. An example that measured an inch and a half in length, was scarcely five-eighths of an inch in breadth: another is recorded by Mr. Jeffreys as being three-quarters of an inch broad, and an inch and a half long.

This rare shell, the specific relations of which are still somewhat obscure, was procured from the neighbourhood of Cork by Mr. Humphreys, and from off the Wexford coast by Mr. Stutchbury.

SPURIOUS.

B. GLACIALE, Linnæus?

Buccinum glaciale, LINN. Syst. Nat. ed. 12, p. 1204; Fauna Suecica, ed. 2, p. 523 (probably). — DONOV. Brit. Shells, vol. v. pl. 154. —MATON and RACK. Trans. Linn. Soc. vol. viii. p. 136 (from Linn.).—MONT. Test. Brit. Suppl. p. 109.—TURT. Conch. Diction. p. 13.—FLEMING, Brit. Anim. p. 343.—BROWN, Illust. Conch. G. B. p. 4, pl. 4, f. 12, 13.

Buccinum Donovani, Gray (Reeve ?) Zoology to Beechey's Voyage, p. 129.—Brit. Marine Conch. p. 214. — Gould, Invert. Massach. p. 304, f. 208.—Dekay, New York Mollusca, p. 134.

,, *tubulosum*, Reeve, Conch. Icon. vol. iii. Bucc. pl. 13, f. 105 (probably).

A boreal species; introduced as a native of the Orkneys by Donovan, whose specimen still exists in Mr. Hanley's cabinet, and is precisely identical with the species figured and delineated by Gould as the Donovani *of Gray, who pronounces it distinct from the* B. glaciale, *of Lamarck, of which Chemnitz's figure (Conch. Cab. vol. x. pl.* 152, *f.* 1446, 1447 ; B. carinatum, *Phipps) may be regarded as the type. The description in the Fauna Suecica, however, applies far better to Donovan's shell, than to the coarsely ridged individual delineated by Chemnitz.*

Note.—The four following shells are evidently the fry of a species of *Buccinum* (the two first probably of *undatum*) or of some allied genus: they are so imperfectly characterized and wretchedly drawn, that we hesitate to refer them to any definite species.

Buccinum breve, Adams, Trans. Linn. Soc. vol. iii. pl. 13, f. 4, from which Mont. Test. Brit. p. 250 ; Maton and Rack. Trans. Linn. Soc. vol. viii. p. 140 ; Turt. Conch. Diction. p. 19 ; Flem. Brit. Anim. p. 344 ; Brown, Ill. Conch. G. B. p. 4, pl. 4, f. 16, 17.

.. *minutum*, Adams, Trans. Linn. Soc. vol. iii. pl. 13, f. 5, 6, from which Mont. Test. Brit. p. 250 ; Maton and Rack. Trans. Linn. Soc. vol. viii. p. 140 ; Turt. Conch. Diction. p. 19 ; Flem. Brit. Anim. p. 344 ; *Cassidaria minuta*, Brown, Ill. Conch. G. B. p. 5, pl. 4, f. 2.

.. *læve*, Adams, Trans. Linn. Soc. vol. iii. pl. 13, f. 7, 8, from which Mont. Test. Brit. p. 251 ; Maton and Rack. Trans. Linn. Soc. vol. viii. p. 140 ; Turt. Conch. Diction. p. 19 ; Flem. Brit. Anim. p. 344 ; *Cassidaria lævis*, Brown, Ill. Conch. G. B. p. 5, pl. 4, f. 1.

.. *obtusissimum*, Adams, Trans. Linn. Soc. vol. iii. pl. 13, f. 9, 10, from which Mont. Test. Brit. p. 251 ; Maton and Rack. Trans. Linn. Soc. vol. viii. p. 140 ; Turt. Conch. Diction. p. 19 ; Flem. Brit. Anim. p. 344 ; *Cassidaria obtusissima*, Brown, Ill. Conch. G. B. p. 5, pl. 4, f. 3.

FUSUS. Lamarck.

Shell fusiform, usually strong, solid, and often invested with an epidermis, spire produced, body-whorl ventricose, surface ribbed, sulcated, spirally striated, or rarely nearly smooth; aperture ovate, produced below into a more or less elongated canal; pillar lip smooth. Operculum corneous, unguicular, its nucleus terminal.

Animal ample, its head flanked by rather thick subulate tentacula, bearing the eyes on bulgings on their outsides not very far above their thickened bases, which internally are separated from each other by a capital lobe: proboscis long, tongue armed with transverse rows of teeth, each row composed of a quadrate axile loop, flanked on each side by a hamate or scythe-shaped lateral; mantle even-edged, siphon not very much produced beyond the canal; branchial plumes two, unequal; male organ large, falcate, flattened; foot large, oval, sub-truncated in front, obtuse behind, bearing the operculum on a very short rounded lobe. Nidus of one or more corneous capsules.

The *Fusi* which occur in the British seas belong to that section upon which Mr. Gray has revived the genus *Chrysodomus* of Swainson, and which along with *Buccinum undatum* and its allies, constituted the old genus *Tritonium* of O. F. Müller; a name that might be used, as several naturalists have proposed of late years, with advantage, were it not that it has unfortunately been adopted into general use for a very distinct assemblage of *Muricidæ*. Mr. Searles Wood includes the *Fusi* in *Trophon*, and Agassiz has proposed to call them *Atractus*.

The sectional group is mainly composed of species from cold or temperate regions. They inhabit all depths of water between the laminarian zone, and one hundred or more fathoms, but are mainly characteristic of the coralline region.

F. Islandicus, Chemnitz.

Fusiform, more or less narrow, smooth, sulcated, or flatly costellated, but not geniculatedly or nodosely corded; apex not symmetrically coiled: outer lip thin, not expanded.

Plate CIII. fig. 1, 3, and (Animal) Plate S. S. fig. 2.

Lister, Hist. Anim. Angl. pl. 3, f. 4; Hist. Conch. pl. 913, f. 5.
Murex corneus (not of Linn.), Penn. Brit. Zool. ed. 4, vol. iv. p. 124, pl. 76, f. 99. — Pulteney, Hutchins, Hist. Dorset, p. 43. — Donov. Brit. Shells, vol. ii. pl. 38.—Mont. Test. Brit. vol. i. p. 258. —Maton and Rack. Trans. Linn. Soc. vol. viii. p. 147 (not diagnosis). — Rack. Dorset Catalog. p. 47, pl. 17, f. 5.— Dillw. Recent Shells, vol. ii. p. 733.—Wood, Index Testaceolog. pl. 27, f. 107. — Fleming, Edinb. Encyclop. pl. 203, f. 7.
„ *Islandicus*, Gmelin, Syst. Nat. p. 3555.
Buccinum canaliculatum gracile, Da Costa, Brit. Conch. p. 124, pl. 6, f. 5.
Fusus Islandicus, Chemnitz, Conch. Cab. vol. iv. p. 159, pl. 141, f. 1312, 1313. —King, Ann. Nat. Hist. vol. xviii. p. 246. — Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 450.—Desh. Encyclop. Méth. Vers, vol. ii. pt. 2, p. 160.—Hanl. Young Conch. p. 83.— Gould, Invert. Massach. p. 284.—Dekay, New York Moll. p. 144, pl. 8, f. 185.
„ *antiquus!* Crouch, Introd. Lam. Conch. pl. 17, f. 8.
„ *corneus*, Fleming, Brit. Animals, p. 348.—Forbes, Malac. Monens. p. 26, animal.—Johnston, Berwick. Club, vol. i. p. 235.—Macgilliv. Moll. Aberd. p. 169. — Brit. Marine Conch. p. 200.— Brown, Illust. Conch. G. B. p. 8, pl. 6, f. 7, 9.—Say, American Conch. pl. 29, larger fig. — Kiener, Coq. Vivant. Fusus, pl. 7, f. 2 (apex ?)—Reeve, Conch. Icon. vol. iv. Fusus, pl. 11, f. 43.
„ *Listeri*, Jonas, Hamburgh Nat. Hist. Trans. vol. i. pl. 10, f. 13.
Tritonium Islandicum, Lovén, Index Moll. Scand. p. 11.—Middend. Malacozool. Rossic. pt. 2, p. 144.
„ *gracile*, Lovén, Index Moll. Scandin. p. 11.
Fusus gracilis, Alder, Cat. Moll. Northumb. and Durh. p. 63.
Trophon gracile, Searles Wood, Crag Mollusca, p. 46, pl. 6, f. 10, a—c.

We are aware that of late years the ordinary British specimens of this elegant shell have been separated from the

Fusus Islandicus of Chemnitz as a distinct species; we believe, however, that Middendorff, who has laboriously investigated the laws that regulate the extent of varietal distinctions, has correctly reunited the two forms.

Beneath a glossy and smoothly attached conspicuous epidermis, that is yellow, or brownish yellow on the pale examples, and brown on the darker ones, this graceful shell, which is fusiform or oblong-fusiform in figure, is of an uniform tint, that ranges from pure white to pale vinous red, or ochraceous flesh-colour. It is adorned with frequent and very depressed spiral costellæ, which are generally, but not always, so closely disposed on the earlier turns, that the volutions should rather be termed sulcated, but on the final whorls are inferior in breadth to the intervals between them: there are some faint and minute longitudinal wrinkles, but no regular series of them, as in the larger allied species. Of the eight volutions that compose the shell, the apical coil in the typical forms is usually distorted, mammillary, and larger than the succeeding one; the rest are of moderate longitudinal increase, are convex or subventricose (sometimes even rounded), taper gradually above, and are peculiarly well defined, not merely by a profound sutural line, but by the almost perpendicular abruptness with which they rise from it; sometimes they convexly shelve above to the suture; sometimes they subangulately project there beyond each other: the latter is usually the case in those examples, in which the blunt-pointed spire, which is always gradual in its attenuation, is shorter than usual. The body slightly exceeds the rest of the whorls united, and usually occupies five-ninths of the total length, it tapers below rather suddenly, and very considerably, to a more or less curved and somewhat twisted, but neither slender nor much produced tail, so that the left basal outline is deeply incurved: the anterior declination is rounded, but rather gradual. The mouth, which fills one-half of the entire length, and is generally of a shining porcelain white, and devoid of all sculpture, is acutely contracted above, and of an oblong-oval figure that is produced below in a rather broad and gently reflected oblique canal. The outer lip is simple, very sharp-edged, not at all patulous, only moderately projecting, gently arched above, and slightly retuse or straightish anteriorly. The pillar is smooth and lustrous, has rarely a very thick layer of enamel, is of a rich flesh-colour in the darker individuals, and is sinuous in outline, being deeply concave in the middle, but bending off obliquely and subrectilinearly at about one-third of the distance from the tip of the canal.

The average size of examples is from about two inches and a-half by thirteen lines, to three inches in length, and one and a-quarter in breadth. We have chiefly drawn up our description from the beautiful slender form that is most commonly preserved in cabinets. There are, however, many varieties of this interesting shell, among which two—in which the outer lip is peculiarly arcuated, and the enamel thickly spread on the columellar lip—may more particularly be specified; the one, a large thin ventricose form, dredged from the Doggerbank, at a depth of fifty fathoms; the other, a very coarse and solid-ventricose form from Brixham, in which the costellæ of the smaller turns are well raised, and the whorls are nine in number: this we take to be the typical *Islandicus* figured in Chemnitz.

The animal is of a general dull yellowish-white hue; the sides of the foot, when at rest, are greatly corrugated; its anterior extremities are obtusely angulated, the caudal one rounded and bearing the operculigerous lobe very far back. The head is broad, the neck narrow, and the tentacles linear-lanceolate and much flattened. The hinder edges of the tawny-yellow operculum overlap its lobe considerably. The male organ is lanceolate and falcate. The axile denticles of the tongue are either obscurely or not at all serrated below, the laterals have two small serrations at their inner side, one large one outside.

This species is distributed all round our shores, though sparingly in the southern districts. It ranges from five to eighty or more fathoms. A ventricose variety occasionally occurs, and a very slender form has been taken by Professor Macgillivray, off Aberdeen. It ranges from the British, throughout the boreal seas, and along the coasts of North America, from Massachusetts to Greenland. As a fossil, it dates its British history from the coralline crag epoch, and is abundant in the red crag.

F. PROPINQUUS, Alder.

Resembling the last, but the apex of the spire symmetrically spiral.

Plate CIII. fig. 2, and (Animal) Plate S. S. fig. 1.

Fusus corneus, var. pygmæus, GOULD, Invert. Massach. p. 284, f. 199 ? ?
„ „ „ BROWN, Illust. Conch. G. B. pl. 6, f. 11, 12 ?
„ *Islandicus, hispid var.* HOWSE, Ann. Nat. Hist. vol. xix. pl. 10, f. 5.
„ *propinquus*, ALDER, Moll. Northumb. and Durh. p. 63.
„ (no name), REEVE, Conch. Icon. vol. iv. Fus. pl. 20, f. 82.
„ *Sabini* (not of GRAY), FORBES, Mem. Geol. Surv. G. Brit. vol. i. p. 25.

" This species very much resembles *F. gracilis* (*Islandicus var. gracilis*), but never grows to half the size, and may readily be distinguished from it by an examination of the apex. The nucleus of *F. propinquus* consists of two or three small compact whorls, while that of *F. gracilis* has only about a whorl and a-half, which are large and rather produced at the top, giving the apex a mammillated appearance. The embryos of these two species must therefore differ as much from each other as those of *F. Turtoni* and *Norvegicus*. The shell of *F. propinquus* is rather more tumid, and the whorls rather flatter in the middle, and more raised towards the suture than in *F. gracilis:* the striæ also are closer, the aperture more contracted towards the canal, and the latter a little more bent" (Alder).

"A variety from deep water (Ann. Nat. vol. xix. pl. 10, f. 5), is shorter in the spire, and more tumid in the body-whorl, and has the canal very much twisted to the left side. The epidermis is thin, pale yellowish horn-coloured and hispid. The apex is frequently incrusted with black. The animal is white" (Alder).

Our description of the preceding species will apply likewise to the present one, except in regard to the apex, which is not oblique and distorted, but symmetrically spiral: the whorls, too, are shorter, scarcely taper above, but are, as it were, more square-cut, standing out from each other in a slightly scalar fashion: the basal declination of the body, likewise, is more flattened. It is much smaller in size, measuring only an inch and a-half in length, and but little more than half an inch in breadth. The ash-coloured epidermis, though spirally ciliated, for the most part, in the young, does not clearly exhibit this feature in adult examples.

The animal, of which we have given a figure from a drawing by Mr. Alder, is very similar to that of *Islandicus*, but has slender tentacula, and is of a much whiter colour. Its dentition differs; the axile teeth bear three equal denticulations below; the laterals have two large nearly equal inner denticles, and one very large outer one.

We have taken this shell, alive, on sandy ground, in eighty fathoms, off the west coast of Zetland, and it is found usually in deep water all around those islands (M'Andrew and E. F.). According to Mr. Jeffreys, it occurs at Bantry, in Ireland. On the Northumberland coast it is found in the same situations with *Islandicus*, but is rare (Alder); in sixty fathoms off Northumberland (Howse). It is probably essentially a boreal species. In the northern drift it is a common fossil.

F. Berniciensis, King.

Fusiform, encircled with cords and threads, which are rendered more or less nodulous by fine raised longitudinal wrinkles: apical coil not distorted; outer lip somewhat thickened, a little expanded.

Plate CV. fig. 1, 2, and CVI. fig. 1.

Fusus Berniciensis, King, Annals Nat. Hist. vol. xviii. p. 246.
„ *Islandicus*, Alder (not of Chemnitz), Cat. Moll. Northumb. and Durh. p. 64.

The extreme rarity of this beautiful shell renders it probable that certain of the features indicated in our description may prove rather to appertain to the specimen than to the species. Although allied in form to the two preceding shells, the peculiarities of its sculpture and aperture readily distinguish it from either. It is of a fusiform shape, which is rather more attenuated above than below, and is chiefly swollen a little below the middle. It is moderately strong, yet not quite opaque, and is clothed with a somewhat shining shaggy brown epidermis, which is not thick and level, but so disposed in longitudinal flakes and reflected, where it passes over the riblets in fringe-like filaments, as partially to reveal the decussated sculpture beneath it. The surface is of an uniform more or less glossy white or pinkish white, and is both encircled throughout with narrow prominent cord-like costellæ, and traversed lengthways by very closely disposed and somewhat slanting raised wrinkles. The former, of which there are generally six on each of the principal turns of the spire, and which are very numerous on the body-whorl, on whose lower half they become less elevated (elsewhere they are about equal in projection), are separated from each other by broad intervals, with, for the most part, on the larger turns, an intervening spiral thread or raised stria; both cords and threads are crossed and geniculated by the ridge-like wrinkles. Four-sevenths of the dorsal length is occupied by a spire, composed of eight ventricose whorls, which, although merely separated by a fine suture (of moderate obliquity), are very distinctly defined, being more rounded below, more flatly shelving and taper above; they are of moderate height, and of rather quick longitudinal increase; the apical coil is blunt, regularly spiral, and very depressed. The body is somewhat pear-shaped; it is occasionally, if not always, a little retuse near the suture, is ventricose posteriorly, and rather abruptly attenuates, with a moderate and convex basal declination, to a gently recurved somewhat tapering slightly twisted shortish beak, that fills the anterior fourth of that volution. The mouth, which is of a reversed flask-shape, being oval above, and produced below into a moderately long and very broad canal, occupies half, or rather more than half, of the entire length; it is destitute of any peculiar sculpture, is of a pinkish flesh-colour, and is more than twice as long as it is broad. The more or less expanded outer lip is usually somewhat thickened, but is neither marginated nor ribbed behind; for more than two-thirds of its sweep it is prominently arcuated, and then at the commencement of the canal rather suddenly slants with comparative straightness towards the axis. The edge of it is indented by the external cords, is very sinuous in its course, being a little concave near its junction with the body (which latter generally occurs at nearly a right angle), then arching forwards (swelling out more especially below the middle), it again becomes subretuse at the beginning of the beak, and finally convexly and considerably receding. The enamel, though apparently not thickly spread on the pillar, is rather widely diffused upon the body. The columella is narrow, and by no means solid; the left side of the canal is rather loosely coiled. The horny operculum is not particularly strong, is of a yellowish brown, and is marked with indistinct longitudinal ridges, in addition to the wrinkles of increase: it is of a somewhat elliptic form, that is attenuated at both extremities, but much narrower at the curved and lustrous end than at the other. The adult example delineated in our engravings measured three inches and a half long, and twenty lines across at the broadest diameter.

This very rare shell was found in fishing-boats on the Northumberland coast by Mr. King.

F. ANTIQUUS, Linnæus.

Oval-subfusiform, densely and strongly striated; nucleus not large; mouth longer than spire: a prominent siphonal ridge.

Plate CIV. (fig. 2 a little reduced).

LISTER, Hist. Anim. Angl. pl. 3, f. 1; Hist. Conch. pl. 913, f. 4.—Encycl. Méthod. Vers, pl. 426, f. 5.

Murex antiquus, LINN. Syst. Nat. ed. 10, p. 754; ed. 12, p. 1222. — DONOV. Brit. Shells, vol. i. pl. 31 (changed from *despectus*).—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 145. — RACK. Dorset Catalog. p. 47, pl. 17, f. 4. — TURT. Conch. Diction. p. 88. — MÜLLER, Zool. Danic. pl. 118. — DILLW. Recent

Shells, vol. ii. p. 724. — WOOD, Index Testaceolog. pl. 26, f. 89.

Murex despectus (not LINN.), PENN. Brit. Zool. ed. 4, vol. iv. p. 124, pl. 78, f. 98.—PULTENEY, Hutchins, Hist. Dorset, p. 43.—DONOV. Brit. Shells, vol. i. pl. 31.—MONT. Test. Brit. vol. i. p. 256; Suppl. p. 111.—BORN, Test. Mus. Vind. p. 314.

„ *decollatus* (FRY), PENN. (not LINN.) Brit. Zool. ed. 4, vol. iv. p. 125, pl. 79 ?—DON. Brit. Shells, vol. iii. pl. 86.

Buccinum canaliculatum magnum, DA COSTA, Brit. Conch. p. 120, pl. 6, f. 4.

„ *&c. &c.* CHEMNITZ, Conch. Cab. vol. iv. pl. 138, f. 1292, 1294.

Tritonium antiquum, O. FABRIC. Fauna Grœnlandica, p. 397.

Murex carinatus, TURTON, Conch. Diction. p. 88, f. 95.

Fusus antiquus, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 447.—FLEMING, Brit. Anim. p. 348. — FORBES, Malac. Monens. p. 25, animal. — JOHNSTON, Berwick. Club, vol. i. p. 234. — MACGILLIV. Moll. Aberd. p. 169.—Brit. Marine Conch. p. 200.—BROWN, Illust. Conch. G. B. p. 8, pl. 6, f. 8.—KING, Ann. Nat. Hist. vol. xviii. p. 243.—ALDER, Moll. Northumb. and Durh. p. 65.—BLAINV. Faune Franç. Moll. p. 80, pl. 4, A. f. 3. — DESHAYES, Encycl. Méthod. Vers, vol. ii. pt. 2, p. 158. — KIENER, Coq. Vivant. Fusus, p. 28, pl. 18, f. 1. — HANL. Young Conch. p. 83. — REEVE, Conch. Icon. vol. iv. Fusus, pl. 11, f. 44.

„ *carinatus*, Brit. Marine Conch. p. 200. — BROWN, Illust. Conch. G. B. p. 127, pl. 57, f. 20 (erroneously marked 18).

„ *Babylonicus*, BROWN, Illust. Conch. G. B. p. 127, pl. 57, f. 19 (monstrosity).

Tritonium despectum, var. antiquata, MIDDEND. Malac. Rossic. pt. 2, p. 135.

Murex contrarius (FOSSIL), SOWERBY, Min. Conch. pl. 23.

Trophon antiquum (FOSSIL), SEARLES WOOD, Crag Mollusca, p. 44, pl. 5. f. 1.

It is chiefly in shape that the variation, permitted to each species, displays itself in the present shell. The ordinary form of medium-sized specimens is oval-fusiform, with the spire occupying about two-fifths of the dorsal length (and a still more slender variety is likewise occasionally taken) but the greatest diversity of figure is that presented by the large swollen Irish (deep water?) example, delineated in our engraving, wherein the body is not merely more tumid than usual, and twice as long as the spire, but the area of it is vastly more extended than in general, and the outer lip is extraordinarily prominent and patulous.

Although the substance of the shell is thick, yet at times there is a slight degree of translucency; the colour is usually of an uniform tint that ranges from pure white to orange-brown; occasionally the stages of increase are indicated by indistinct broadish streaks, of a more intense shade than the general tint. The depressed costellar striæ, with which the principal volutions are encircled throughout, and which are often rendered wavy (frequently, indeed, interrupted) by coarse wrinkles of increase, are so closely disposed that finer intermediate ones start forth wherever the space permits. They are generally of about equal magnitude throughout, somewhat finer beneath the sutures, somewhat coarser on the extreme base; occasionally, however, a few of them, chiefly on the upper third of the body and near the middle of the larger turns of the spire, become more elevated than the rest (as in the *carinatus* of Turton), yet never assume that coarse ridge-like appearance that is characteristic of the more distantly striated *carinatus* of Pennant. Besides the smooth apical nucleus, which consists of two coils, the first bluntly mamillary and swollen, the second narrowly cylindrical, the spire comprises four other whorls that are of fast longitudinal increase, of moderate height (at least half as long as broad, often indeed in the slender forms the length is to the breadth as three to five), moderately ventricose, often subangulated rather above the middle, much tapering above, and in that case shelving with some little retusion (not deeply concave) towards the fine yet profoundly impressed moderately slanting suture; more perpendicular below. The body, which is swollen above, and thence attenuates to a shortish and scarcely recurved beak, is of a curved and truncated fig-shape; its basal declination is not abrupt, but is convex or rounded.

The capacious aperture, which is entirely devoid of sculpture, and occupies on the average four-sevenths of the ventral length, is sometimes of a rich orange colour (chiefly so in the externally colourless examples, sometimes of a pure porcelain white; it is of an oval shape that is produced below as a broad and somewhat patulous canal that bends but slightly (except in a variety which we have not seen in England) to the left. The outer lip, the angle formed by which with the body-whorl, is nearly a right one, is more or less prominently arcuated, until nearly parallel with the posterior junction point, when it somewhat suddenly slants, for the short remaining space, in a straightish line: it is simple, acute, a little disposed to expand in the more aged examples, and does not recede much at the anterior extremity. The course of the inner lip, though a little sinuated, is tolerably perpendicular on the whole, the concavity is not profound; the straightish lower portion fills about one-third of the length. The enamel is rather thickly spread on the pillar where it very gradually narrows to a fine extremity. The siphonal fold-like ridge is often made rugged by the coarse scale-like projections which arise from the stages of increase. The larger of the specimens delineated measured six inches in length, and nearly three inches and a-half in breadth, and a nine-whorled example, taken by Professor King, was seven inches long and five broad.

The capsules are only half an inch in diameter, are convex outwardly, and concave in the inner side, coarse and corrugated, and piled one upon another in a conical heap, three inches or so high. "Previous to exclusion," writes Dr. Johnston, "the young are perfectly formed; the eyes, tentacula, and operculum of the animal are very distinct, and the shell, which is of an uniform flesh-colour, has three or four whorls, and is fully four lines in length. They ultimately make their escape by a dissolution or rupture of the cells, for there is no aperture in the inner coat, and the slip in the outer one seems intended merely to admit the water necessary to their covering.

The animal is white, or yellowish-white ; its head is rather broad, its tentacula flattened and broad-band, the eyes small. The siphonal tube is marked with black specks, and in few are sometimes present in the head. The foot is ample, and below is of a deeper yellowish colour than the body.

The axile denticles of the tongue are broadly oblong and three-toothed below, the laterals have two or three large serrations on their peduncles below.

The shell, according to Dr. Fleming, is used by the Zetlander as a lamp, and forms a by no means inelegant one, as its outline is exceedingly graceful.

The *Fusus antiquus* has a range of from five to thirty fathoms, living on various kinds of ground, but preferring shell banks. It is very rare on our southern shores, but becomes common as we go north, and in some parts of the Irish sea is a very abundant shell. Of its varieties, the subcarinated form is taken in abundance off the south-east of Ireland, as at Dungarvan (Dr. Farran). On the Manx coast, a small yellow-mouthed variety is most abundant. Mr. G. B. Sowerby procured a reversed specimen from off the mouth of the Thames, and also a scalariform monstrosity, both of which are in Mr. Jeffreys' magnificent collection. The range of this species is, typically, boreal and arctic.

F. Norvegicus, Chemnitz.

Oval, or fusiform-oval, smooth, or nearly so; mouth much longer than the spire; canal short and wide; no siphonal ridge.

Plate CVII. and CVIII. f. 7, 8, 9.

Strombus Norvegicus, Chemnitz, Conch. Cab. vol., x. p. 218, pl. 157, f. 1497, 1498.—Dillw. Recent Shells, vol. ii. p. 675.—Wood, Index Testaceolog. pl. 25, f. 37.

Fusus „ Turton, Mag. Nat. Hist. vol. vii. p. 351.—Brit. Marine Conch. p. 207.—King, Ann. Nat. Hist. vol. xviii. p. 244.—Howse, Ann. Nat. Hist. vol. xix. p. 162, pl. 10, f. 1, 2, 3, 4.—Alder, Cat. Moll. Northumb. and Durh. p. 65.—Reeve, Conch. Icon. vol. iv. Fusus, pl. 12, f. 47.

Tritonium Norvegicum, Middend. Malacoz. Rossic. pt. 2, p. 147.

The only British shell with which it is possible to confound the present is *F. antiquus*, from which its much larger apical nucleus, smoother surface, shorter and wider canal, and the absence of a siphonal ridge, suffice to distinguish it.

The shell is of an oval-fusiform shape, rather more attenuated above than below, more or less solid, yet rarely quite opaque, not very glossy, and smooth or nearly so, being only obsoletely and rather closely sulcato-striated in a spiral direction, and chiefly on the smaller turns. The light brown epidermis, from its extreme tenuity, is rarely preserved, except in patches. The external colouring ranges from pinkish flesh to fawn-colour; the aperture in the younger specimens is merely of the same hue, but more intensely painted; in aged individuals it is tinged with bluish pink. The smooth distorted orange-tinted apical nucleus consists of at least two coils, "as large as in some of the mamillated *Volutes*" (King); the upper one is the more bulbous, the lower rather the flatter. The longitudinal increase of the three next whorls (the remainder of the spire) is rapid; they taper and become very slightly retuse near the moderately slanting suture (which is profoundly impressed, and slightly overlapped, as it were, by the successive coils), and swell out considerably rather below the middle. The ventricose, but not abruptly tumid, body, which is fig-shaped, occupies about three-fifths of the dorsal length; it gradually attenuates below, with a gentle convex declination, to a broad short round-tipped beak, which is not distinguished by any siphonal fold-like ridge. Owing to the marked ascent of the acute and much expanded outer lip, which is simply but prominently arcuated (not displaying that basal interruption of its sweep that is usual in beaked *Fusi*), the capacious aperture, which is devoid of all sculpture, is enlarged so as to fill two-thirds or more of the ventral length: it is of an oblong oval shape, is acutely peaked above, and more bluntly so below, where it terminates in a remarkably broad short canal. The enamel of the inner lip is rather widely diffused, and often of a whiter cast than the rest of the surface. The course of the left lip is at first gently convex, then moderately concave, and finally curves slightly to the left. The pillar is solid enough, but is somewhat loosely coiled. Four inches and a-half for the length, and half that measurement for the breadth may be considered the average dimensions of fine examples. The operculum is very small, and somewhat ovate.

Of the spawn of this rare and interesting shell, the following account is given by Mr. Howse, in the Annals of Natural History:—"Only two were taken; they are of a subhemispherical form, about one inch in diameter, and are agglutinated separately by a very thin, produced marginal rim to the inside of odd valves of *Cardium echinatum.*

The envelope is coriaceous, of a horny appearance, very transparent, smooth, glossy, and of a yellowish colour; one of the capsules contained three, the other only two embryos. The last were far advanced, and apparently ready to leave the case. Through the transparent covering, when first dredged, I could see them moving about and adhering to the inner surface of the capsule by the expanded foot, the sides of which were of a faint lilac colour. The thin operculum, the flattened tentacles, the diminutive spot-like eyes of these beautiful and interesting creatures were also distinctly visible. The young shell is very thin, brittle, pellucid, brilliantly glossy, and of a pale amber-colour, nipple formed, and perfectly resembles the nucleus or upper whorl of the adult individual, as will be seen by referring to the accompanying plate. Those most advanced in growth have two whorls, and are half an inch in length, by a quarter in width."

Of the animal of this species, we have seen a preserved specimen in Mr. Alder's collection, exhibiting traces of purplish markings on a white ground. According to Professor King, the *mucro* of its male organ is very much produced and spirally disposed, measuring as much as an inch and five-eighths in length; and the mantle is much thickened on the columellar side of the body-whorl.

This very rare and very fine shell was added to our fauna by Mr. Bean, at Scarborough, Professor King, too, procured it from the Doggerbank. Mr. Howse has dredged it in sixty fathoms water off the Durham coast. It appears to be found fossil in the pleistocene beds of Sweden.

F. Turtoni, Bean.

Oblong-subfusiform, more produced above than below, simply and flatly costellated; nucleus large; mouth rather shorter than the spire; outer lip dilated; a siphonal ridge.

Plate CV. f. 3, 4, and CVI. f. 2, 3, 4.

Fusus Turtoni, Bean, Mag. Nat. Hist. vol. vii. p. 493, f. 61.—Brit. Marine Conch. p. 208.—Brown, Illust. Conch. G. B. p. 8, pl. 7. f. 1. —King, Ann. Nat. Hist. vol. xviii. p. 245.—Howse, Ann. Nat. Hist. vol. xix. p. 163, pl. 10, f. 6 to 10.—Reeve, Conch. Icon. vol. iv. Fusus, pl. 20, f. 83.

This rare and elegantly-formed species bears more resemblance to the *Buccinum undatum* than to its own congeners. It is of a somewhat fusiform shape, that is produced above, and abbreviated below, and beneath a transparent yellowish horn-coloured epidermis is of a rather dull and squalid white, that is apt to become liver-coloured toward the apex. The principal whorls are encircled throughout with somewhat depressed broadish cords, which grow fainter posteriorly; these are more or less interrupted by coarse wrinkles of increase, but there is not the slightest appearance of any longitudinal folds. A blunt-topped triple-coiled apical nucleus terminates the spire, which comprises, in addition, four or five other volutions, which are of moderate height, tolerably fast longitudinal increase, more or less ventricose in and beneath the middle, and more flatly shelving and clearly tapering towards the broadish suture, which latter is moderately slanting and strongly impressed. About one-half of the dorsal length is filled by the body, which is ventricose in the middle, subretuse above (more especially when that part is bounded anteriorly by a riblet that is more projecting than the rest), and of gradual and not much rounded basal declination; it tapers rather quickly below, where a distinct siphonal fold crowns the rudimentary beak. The aperture is slightly surpassed in length by the spire, is devoid of sculpture, and of a more or less oval shape, that is angulated above, and not much attenuated below, where it terminates in a rather open canal. The less exposed portion of the throat is of a reddish-brown in the young, and changes to purplish-brown in the more aged examples: towards the outer lip, however, it is, as is likewise the not much spread enamel of the inner lip, of a pure white. The outer lip, which does not recede much anteriorly, and usually juts out from the body at nearly a right angle to the left lip, is thickened, expanded, and prominent: it runs at first in a straightish or sub-retuse line, is somewhat perpendicular and convex in the middle, and slants towards the axis below with but little convexity and hardly apparent rostral sinuation. The course of the inner lip is peculiar, being but little concave in the middle, and slanting to the right anteriorly. The columella is solid, much twisted, somewhat rounded, and provided with a distinctly reflected pillar lip. The operculum is large and pyriform (King). An eight whorled specimen that was five inches in length, measured two inches and three-eighths in breadth; another of nearly five inches and a-half in length, measured only two inches and a-sixth at the broadest part.

Mr. Howse has drawn up the following account of the ova-capsules, from three examples fished up on the Northumbrian coast:—" They differ completely from those of *F. Norvegicus* in shape, in being double, in number of embryos, and in mode of attachment; but agree with them in being solitary. They are ovate, compressed, lentiform, and are supported on a short flattened peduncle. This peduncle is a production of part of the margin of the capsule, and is considerably spread at its base over the surface to which it is attached. The capsule is composed of an inner and an outer case; the latter is of a pale yellow colour, opaque, not very glossy, coriaceous, and has a few raised lines across the upper surface; the former is very thin, and separated from the latter by a parallel, fibrous, silky layer. One of the capsules is nearly an inch in greatest diameter, and contains six embryos, the largest of which is half an inch in length, by one-fifth in width, and has three volutions which perfectly resemble the apex of the mature individual. They are almost cylindrical, coarse, opaque, the last whorl faintly spirally striated, and of a reddish-brown colour." (Ann. Nat.)

The animal appears to be white, with purple markings. Like that of *Norvegicus*, it is a true *Fusus* in all its characters.

This is one of the rarest and most beautiful of British shells, and was added to our fauna by Mr. Bean, who obtained it from deep water on the Doggerbank off the Yorkshire coast. Mr. Howse dredged it off the Northumberland coast, in sixty fathoms water, whence it has also been procured by Mr. King.

Plate CIII. figs. 4, 5, enlarged.

The fragment, delineated in our engraving, and which has been considered by us as too important to omit, yet insufficient to describe from or determine by, was dredged by Mr. M'Andrew, at Zetland, from a depth of eighty fathoms. The *Trophon antiquum, var. jugosa*, of the "Crag Mollusca," exactly agrees with it, but of recent species it bears most resemblance to a pigmy specimen of the *F. decem-*

costatus of Say,[*] and the *F. despectus, var. carinata* of the present work.

SPURIOUS.

F. despectus, Linnæus.

Linn. Iter Westgothic. pl. 5, f. 8.—Enc. Méth. Vers, pl. 426, f. 4.

Murex despectus, Linn. Syst. Nat. ed. 10, p. 754; ed. 12, p. 1222; Fauna Suecica, ed. 2, p. 524.

Tritonium despectum, O. Fabric. Fauna Grœnlandica, p. 396.

Buccina, &c. Chemn. Conch. Cab. vol. iv. pl. 138, f. 1293, 1295 (the last copied, Wood, Index Testac. pl. 27, f. 92, as *Murex fornicatus*).

Murex antiquus, Mont. Test. Brit. p. 257; Suppl. p. 115.

Fusus despectus, Fleming, Brit. Anim. p. 349.

Simply keeled form.

Murex carinatus, Pennant. Brit. Zool. ed. 4, vol. iv. p. 123, pl. 77, f. 96 (badly), Frontispiece (well).—Donov. Brit. Shells, vol. iv. pl. 109.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 147.—Laskey, Mem. Werner. Soc. vol. i. p. 400 (not supposed young, nor figure).

„ *fornicatus*, Dillw. Recent Shells, vol. ii. p. 725.

Fusus carinatus, Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 449?—Desh. Encycl. Méthod. Vers, vol. ii. p. 159.—Kiener, Coq. Vivant. p. 30, pl. 19, f. 1.—Möller, Moll. Grœnl. p. 14, probably.

Tritonium despectum, var. carinata, Middend. Malac. Rossic. pt. 2, p. 136.

Stunted form.

Murex despectus, Donov. Brit. Shells, vol. v. pl. 180.—Dillw. Recent Shells, vol. ii. p. 726.

Plicato-carinated form.

Tritonium fornicatum, O. Fabric. Fauna Grœnl. p. 399, probably (copied as *Murex fornicatus*, Gmel. p. 3547; =*Fusus fornicatus*, Reeve, Conch. Icon. vol. iv. Fus. pl. 10, f. 39).

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[*] Journ. Ac. Philad. vol. v. p. 214; Gould, Invert. Massach. p. 287, f. 202; Dekay, New York Moll. p. 145, pl. 9, f. 186; Philippi, Neue Conch. vol. i. p. 111, Fusus, pl. 1, f. 12.—*F. multicarinatus*, Potiez and Mich. Gal. Douai, Moll. vol. i. p. 438, pl. 34, f. 5.—*F. lyratus*, Reeve, Conch. Icon. vol. iv. Fus. pl. 10, f. 40 (probably).—*Tritonium decemcostatum*, Middend. Fauna Ross. pt. 2, p. 138.

Murex despectus, Shröt. Einleit. Conch. vol. i. p. 523, pl. 3, f. 5.
„ *duplicatus*, Donov. (changed from *antiquus*), Brit. Shells, vol. iv. pl. 119, copied in Rees' Encyclop. pl. Elem. Conch. 1, f. 10; copied, Wood, Index Testac. pl. 27, f. 93, as *M. despectus*; copied, Brown, Illust. Conch. G. B. pl. 6, f. 10, 13, as *M. carinatus.*
„ *subantiquatus*, Maton and Rack. Trans. Linn. Soc. vol. viii. p. 147.— Dillw. Recent Shells, vol. ii. p. 727.
Fusus despectus, Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 448. — Desh. Encycl. Méthod. Vers, vol. ii. p. 159. — Kiener, Coq. Vivant. Fusus, p. 29, pl. 19, f. 2.
Tritonium despectum, var. varicoso-carinata, Middend. Malac. Ross. pt. 2, p. 138.

A boreal species (from Greenland, &c.) included among our native shells in the various compilations of British Conchology. The carinatus *appeared without any assigned locality; the original specimen, still preserved in Mr. Jeffreys' cabinet, is well delineated as the frontispiece to Pennant's fourth volume, where the incipient folds (omitted in Donovan's representation) are correctly indicated. The last named author candidly avowed that his drawing of* M. despectus *was taken from a Greenland example (a sadly worn one still in existence in the same important collection), but mentions the remark of a friend, that he had seen a shell like it a few miles off the Orkneys. Similarly the* duplicatus, *whose shape is more elongated than any specimen we have ever met with, is figured as a boreal species, to illustrate the difference between it and* carinatus.

TROPHON. (Name) De Montfort.

Shell rather strong, fusiform, spire produced, whorls rough, with lamellar varices, their interstices often spirally sulcated; mouth produced below into a narrow canal; no teeth or plaits on pillar lip. Operculum corneous, unguicular; its nucleus terminal.

Animal rather short from the size of the shell, its head narrow, and bearing two subulate tentacula, with unseparated bases; the eyes placed on thickened connate peduncles, extending nearly half the length of the tentacles. Foot rather short, truncated in front, obtuse posteriorly; operculigerous lobe simple; siphon rather short, seldom projected far from the canal of the shell. Tongue armed with triple rows of teeth, the axile one transversely elongated and quadrate, armed with denticuli, the laterals simply uncinate or hamate.

For this small but natural group of *Muricidæ* we have reserved the name *Trophon*, though it is used by several authors in a wider sense. The species are inhabitants chiefly of deepish water, and for the most part belong to arctic and boreal seas.

T. clathratus, Linnæus.

With longitudinal lamellar riblets, but no regular spiral sculpture.

Plate CXI. figs. 1, 2, and (Animal) Plate S. S. fig. 3.

Murex clathratus, Linn. Syst. Nat. ed. 12, p. 1223 (from type).
Tritonium clathratum, Müller, Zool. Dan. Prod. No. 2941.—O. Fabric. Fauna Grœnland. p. 400.—Lovén, Ind. Moll. Scand. p. 12.—Middend. Malac. Ross. pt. 2, p. 125 (partly).
Murex Bamffius, Donov. Brit. Shells, vol. v. pl. 169, f. 1.—Mont. Test. Brit. Suppl. p. 117.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 149.—Pennant, Brit. Zool. (ed. 1812), p. 285, pl. 82, f. 2.—Turt. Conch. Diction. p. 95.—Brown, Illust. Conch. G. B. p. 7, pl. 6, f. 1, 4.—Dillw. Recent Shells, vol. ii. p. 742.—Wood, Index Testaceolog. pl. 27, f. 126.
Fusus Bamfius, Fleming, Brit. Anim. p. 351.—Forbes, Malac. Monensis, p. 27, animal.—Johnston, Berwick. Club, vol. i. p. 235.—Brit. Marine Conch. p. 206, f. 96.—Dekay, New York Moll. p. 148, pl. 36, f. 339.
„ *Bamffius*, Gould, Invert. Massach. p. 289, f. 198.
Pleurotoma Banffium (not Trophon Banffii of Möller), Macgilliv. Moll. Aberd. p. 171.
Fusus Banffius, Reeve, Conch. Icon. vol. iv. pl. 21, f. 91 (for 90).

The shape of the shell is fusiform or oval-fusiform, being more or less swollen just below the middle, and abruptly attenuated at both extremities, tapering above to a very fine point, and contracting below to a moderately long and somewhat twisted beak, that fills about a third of the length of the body-whorl. When young it is thin, moderately glossy, and of an uniform reddish or brownish flesh-colour; when aged it changes to a squalid white, but is never very solid. Numerous arched and simple (not fimbriated nor laciniated) longitudinal lamellæ or riblike-plates, which are not erect, but are somewhat pressed down, as it were, with the edge inclining towards the aperture, traverse the entire whorls; they range from twenty crowded and thin ones to only twelve comparatively strong and remote ones. The intervals of these lamellæ (which are not spinous nor angulated above) are not distinctly clathrated, yet occasionally a few obsolete revolving ridges are here and there perceptible, and aged specimens usually exhibit some fine spiral striulæ; usually, however, these intervals are quite smooth. The spire, the apical coil of which is twisted and not symmetrical, is composed of nearly seven rounded (not scalar) volutions, that are of moderately fast longitudinal increase, and in general are rather short than otherwise. The body occupies at least four-sevenths of the dorsal length; it is ficiform or fig-shaped, being swollen above and abruptly attenuated below; the basal declination is rounded and more or less sudden. There is no vestige of an axial perforation. The mouth, which is devoid of sculpture, and of an oboval shape, that is produced below in a narrow curved and somewhat elongated canal, which is usually about half as long as the upper part of the aperture, fills from half to four-sevenths of the total length. The prominent outer lip, which has a slight tendency to expand, is thin, simple, and arcuated, but abruptly contracts below in forming the canal; it oftentimes projects almost at right angles to the body. The upper half of the inner lip is moderately incurved, the lower half bends rather suddenly in a straightish or scarcely curved line to the left. The largest specimen we have seen measured three quarters of an inch in length, and a third of an inch across; in general, however, examples are only five-eighths of an inch long and about half as broad.*

The animal is entirely white or yellowish white. Its tentacula are rather short in proportion to its size. Its foot is truncated and ungulated in front, triangular and obtuse behind. The axile denticles of the tongue have obtuse angles, and two rather small, closely set denticuli on each side of a larger central one.

This species is very rare, or absent, on our southern shores, but abundant from the southern entrance of the Irish sea northwards to Zetland. It is frequent also on our eastern coasts, and is found all round Ireland. It ranges from five to fifty fathoms. It is distributed throughout the boreal and arctic regions of the North Atlantic.

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* A fragment (the first four whorls) of a much larger shell (that must have vied in dimensions with the larger figure of *Bamffius* in Donovan) has been taken in the North by Professor Macgillivray. From the size of its volutions, and the remoteness of its lamellæ, it appears to belong to the *scalariformis* of Gould (Invert. Massach. p. 288, f. 203; *Murex lamellatus*, Philippi, Neue Conch. vol. iii. p. 41, Mur. pl. 2, f. 2), which Lovén and Middendorff consider to be merely a large boreal variety of *clathratus*, from which, indeed, it differs in little else than size, its more capacious mouth, more arcuated lip, slightly longer spire, and rather straighter, longer, and abruptly slender beak; the first of which features, though all are present in the more characteristic examples, alone seems permanent. It is so common and characteristic a shell in British pleistocene water, that the fragment in question may have been part of a fossil.

T. MURICATUS, Montagu.

Usually coloured, decussated by spiral costellæ and numerous longitudinal ribs, the former of which are decidedly conspicuous; whorls bluntly subscalar.

Plate CXI. figs. 3, 4, and (Animal) Plate S. S. fig. 5.

Murex muricatus, MONT. Test. Brit. vol. i. p. 262, pl. 9, f. 2. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 149. — TURT. Conch. Diction. p. 95. — BROWN, Illust. Conch. G. B. p. 6, pl. 5, f. 28. — DILLW. Recent Shells, vol. ii. p. 746. — WOOD, Index Testaceolog. pl. 27, f. 138. — CLARK, Annals Nat. Hist. 2nd ser. vol. vii. p. 112.

Fusus „ FLEMING, Brit. Anim. p. 351. — FORBES, Malac. Monens. p. 27, animal.—Brit. Marine Conch. p. 206, f. 97.—HANL. Young Conch. p. 84.—GOULD, Invert. Massach. p. 293.—DEKAY, New York Moll. p. 149.—REEVE, Conch. Iconica, vol. iv. Fusus, pl. 21, f. 88.

„ *echinatus*, J. SOWERBY, Min. Conch. pl. 199, fig. 4.—PHILIPPI, Moll. Sicil. vol. ii. p. 178 (from type).

Trophon muricatum (FOSSIL), SEARLES WOOD, Crag Mollusca, p. 50, pl. 6, fig. 5.

The general shape of this shell is acutely fusiform, as it tapers from the somewhat swollen middle to a fine point, at either extremity. The substance is not thick, and the colouring is simple (not variegated) ranging from pure white (in the boreal form) to pinkish or rufous brown, which latter is the usual tint. The exterior is subcancellatedly decussated throughout by spiral costellæ and longitudinal narrow sublamellar ribs; the latter, which are not much raised, are numerous (in general from thirteen to fifteen on each of the principal turns), yet not so densely disposed as the former, which are square-sided, convex topped, usually geniculated or nodose where they cross the ribs, and having their intervals sometimes mere sulci, sometimes as broad as the riblets themselves. Very rarely (as in the variety *echinata*) short prickles start up in lieu of nodules, at the intersection of the longitudinal ribs with the first costella that distinctly revolves beneath the suture. A very fine but not symmetrically coiled apex terminates the spire, which is composed of seven shortish volutions that are well rounded in the middle. yet are more or less horizontally flattened above so as to be bluntly subscalar; the suture is fine, and but little slanting. The body, which is moderately ventricose above, attenuates rather abruptly with a rounded declination, to a slender tapering tail, that is almost invariably at least half the length of the body, and sometimes, even, forms nearly half the length of the final whorl. The aperture, which is of a reversed flask-shape, being produced below into a scarcely recurved narrow canal (which, is destitute of a siphonal ridge), vies with, or even slightly exceeds the spire in length; it is not at all peaked above, as the outer lip, which, although jagged at the edge by the external riblets, is simple and acute, juts out almost at right angles, and is prominently arcuated until it rather abruptly changes to subvertical at the commencement of the canal. The throat of most adult examples is spirally roughened by raised sulci; the pillar, which is moderately incurved above, and provided in aged specimens with a thin appressed lip, is destitute of any sculpture. A fine example, three quarters of an inch in length measured three-eighths of an inch in breadth.*

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* Under the name of *F. decussatus*, Brown (Illust. Conch. G. B. p. 7, pl. 5, f. 53, 55) has given two discordant delineations of a shell, which, unless intended for *muricatus*, we cannot assign to any existing species known to be a native of our coasts. Figure 53 indeed, is not so unlike it, but more resembles the *rostratus* of Olivi, which may prove indigenous, as a broken individual has been picked up by Mrs. R. Smith at Tenby. Figure 55 reminds one rather of a miniature *F. pyrulatus* of Reeve. The description, which does not well suit either of these two species, runs as follows: —

"Shell fusiform; spire short, consisting of five well rounded abruptly tapering volutions, separated by a deep suture, and little more than a third the length of the body; twelve strong longitudinal ribs cover the shell from the venter to the

The animal is entirely white. The tentacula are much longer and slenderer than in its congeners, and their eye-bearing bases not so thick. The foot is rather narrower, and more produced caudally.

Montagu, and other observers, notice the frequency with which this shell is invested with a crust of red sponge. We have often taken it with this coat upon it.

Though by no means a common shell, this species is found through the greater part of the British seas, occurring chiefly on our western coasts, and from the Channel Isles (Barlee) to Zetland. On the east coast it appears to be rare. It has a great vertical range, from fifteen to fifty fathoms off the English, and from fifteen to seventy on the Scottish shores (M'Andrew and E. F.). It extends round the Irish shores (Thompson).

It has a wide range in the North Atlantic, and has been taken on the western coasts of Spain by Mr. M'Andrew. It ranges throughout the Mediterranean, usually inhabiting very deep water. As a fossil its history dates from the epoch of the coralline crag.

apex, crossed by distant strong spiral striæ, giving the shell a cancellated appearance; body abruptly acuminate beneath; aperture subovate, terminating in a very long narrow and pointed canal, equal in length to the body, the opening in front being very straight; outer lip somewhat thickened and entire, and continuous along the columella, on which it is narrowly reflected; colour cream white. Length one inch five-eighths; breadth an inch. We found this shell at Killough, county of Down, Ireland."

T. Barvicensis, Johnston.

Snow-white, with about twelve longitudinal lamellæ that are fimbriated by inconspicuous spiral costellæ; whorls abruptly scalar.

Plate CXI. fig. 5, 6, and (Animal) Plate S. S. fig. 4.

Fusus Barvicensis, Johnston, Edinb. Phil. Journ. vol. xiii. p. 221; Berwick. Club, vol. i. p. 235.—Fleming, Brit. Anim. p. 351.—Brit. Marine Conch. p. 206, f. 2.—Reeve, Conch. Iconica, vol. iv. pl. 21, f. 86.

Tritonium Barvicense, Lovén, Index Moll. Scandin. p. 12.

This very beautiful shell most closely approaches the preceding species. It is always, however, both within and without, of a pure snow-white, and in place of a nodose decussation of more or less close and numerous longitudinal sublamellar ribs, by equally prominent revolving costellæ, is armed lengthways with highly elevated and rather distant reflected lamellæ (rarely above twelve in number on any of the volutions), which are fimbriated by comparatively obsolete and somewhat remote spiral costellæ, and are usually raised posteriorly in a curved lanceolate prickle, so as to coronate, as it were, the angulated edge of the abruptly scalar volutions, which from this circumstance, perchance, appear broader there than at their lower suture. The body and tail (on which latter the lamellæ are scarcely developed) seem slightly shorter in proportion to the spire than in *muricatus*, to which, both in size and other respects, there is the strongest resemblance.

The animal is entirely white. The form of its head and tentacula much more closely resembles that of *clathratus* than of *muricatus*. The tentacula are rather short, thick, and obtuse. The foot is short behind, and not much produced beyond the operculum. The denticles and angles of the axile teeth are acute and produced.

This pretty and distinct species was first noticed by Dr. Johnston of Berwick, who found it in deep water in Berwick Bay. It is an inhabitant mainly of our northern seas, inhabiting various depths of water, from eighteen to sixty fathoms. We have taken it alive in the Hebrides. It has been dredged also in Loch Fyne, and elsewhere on the west coast of Scotland by Mr. Barlee. Mr. Jeffreys has a specimen procured off Cork by Mr. Humphreys. In sixty fathoms water off the Northumberland coast (Howse).

It ranges to the Arctic seas, but does not extend south of Britain.

Triton elegans, Thompson.

Triton elegans, Thompson, Annals Nat. Hist. vol. xv. p. 317, pl. 19, f. 1.

Oval-oblong, subventricose near the middle, acuminately tapering above to a very fine point, moderately attenuated below; strong, pure white, with two indistinct narrow tawny bands upon the body-whorl, one almost in a line with the top of the aperture, the other halfway between it and the suture. Exterior roughened throughout by coarse and rather distant longitudinal ribs (not continuous from whorl to whorl), that are subnodosely decussated by more closely disposed, yet not crowded, revolving costellæ; intervals of the former, of which there are from ten to twelve on the two principal volutions, broader than the ribs themselves; interstices of the latter, of which we counted five or six on the penult turn, about equal to the costellæ, and divided on the body by an extremely fine parallel thread. A single strong varix, that is somewhat removed from the final rib, projects at a little distance from the outer lip, the intervening area is decussated by longitudinal raised lines or narrow wrinkles. Body slightly longer than the spire, its basal declination gradual, yet rounded : spire of about six rather ventricose moderate sized volutions, that are profoundly divided by a simple suture. Mouth filling half the total length, oval, produced below in a rather narrow canal, that is almost equal to a third of the length of the aperture, and dilates anteriorly. Throat with numerous spiral raised lines, that are not so broad as the intervening sulci. Outer lip acute at the edge, simple, not much arched, not at all expanded. Pillar lip reflected, but appressed ; peculiarly incurved, with one or two subgranular projections at the upper corner, and at the commencement of the canal, between which the surface appears to be slightly and finely corrugated. Length seven lines ; breadth three lines and two thirds.

A unique specimen of this remarkable shell was found by our indefatigable friend Dr. Farran at Portmarnock, and was communicated by him to Mr. W. Thompson, who described and figured it. Although when taken it appeared to be fresh and to exhibit traces of an animal, all our knowledge of its nearest allies (*Triton carduus* and other shells constituting the genus *Hindsia* of Adams) would lead us to refer its original habitat to a tropical province, most probably the West Indian seas.

SPURIOUS.

COLUMBELLA PICTA, Turton.

Purpura picta (not of Scacchi), TURT. Zool. Journ. vol. ii. p. 365, pl. 13, f. 8.
Buccinum pictum, FLEMING, Brit. Anim. p. 344.—Brit. Marine Conch. p. 216.
„ *pulchellum*, KIENER, Coquilles Vivant. Bucc. p. 51, pl. 18, f. 68; trans. Storer, p. 59.
Nassa picta, BROWN, Illust. Conch. G. B. p. 5, pl. 5, f. 65.
Columbella pulchella, SOWERBY, Thesaur. Conch. vol. i. p. 131, pl. 39, f. 121, 122.

A common West Indian shell; introduced by Turton as dredged *in the British Channel. The peculiar sinus of the outer lip separates it from the more typical* Columbellæ.

Columbella hyalina, Montagu.

Voluta hyalina, Mont. Test. Brit. Suppl. p. 101, pl. 30, f. 1. — Turt. Conch. Diction. p. 253.
Cancellaria „ Fleming, Brit. Animals, p. 334.
Cominia „ Brown, Illust. Conch. G. B. p. 22, pl. 8, f. 9.

Montagu's specimen of this shell is still preserved in our National Museum. As a species it is undeserving of attention, being an immature specimen of (as we believe) a Columbella *that has been worn smooth, but which still retains some indistinct traces of sculpture. It was one of the many exotic species stated to have been taken by Laskey near Dunbar, and came probably from the West Indies.*

Columbella cincta, Montagu.

Buccinum cinctum, Mont. Test. Brit. p. 246, pl. 15, f. 1. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 139.—Rack. Dorset Catalog. p. 45, pl. 14, f. 17.—Turt. Conch. Diction. p. 17.—Brit. Marine Conch. p. 218. — Dillw. Recent Shells, vol. i. p. 639. — Wood, Index Testaceolog. pl. 24, f. 121. — Blainv. Faune Franç. Moll. p. 175.
Nassa cincta, Fleming, Brit. Animals, p. 340.
„ *Bryerii*, Brown, Illust. Conch. G. B. pl. 4, f. 26 (not description).

Shell minute, oval-conic, rather strong, yellowish white, encircled on the body-whorl by two not very wide rufous brown or chocolate coloured zones, the lower one of which is basal and stains the anterior tip of the aperture; the upper, which is continued upon the smaller turns below their middle, only divided from the suture by a pale strip of about its own breadth. Surface adorned throughout with very numerous longitudinal nearly perpendicular costellæ or narrow ribs, whose intervals, which are about equally broad, are crossed by moderately close-set spiral striæ, which, always strong, become especially so at the lower extremity. Spire composed of about six shortish turns, whose suture is simple, but which are clearly defined, tapering above, and simply convex; body more or less ventricose and convex, not attenuately produced nor beaked anteriorly. Mouth not very narrow, scarcely so long as the spire. Outer lip thickened externally, denticulated within; usually with a brown spot and subsinuated posteriorly. Length rather exceeding the fifth of an inch; breadth only a line.

A West Indian shell allied to the parva *of Sowerby's Monograph of the* Columbellæ (*Thes. Conch. vol. i. p.* 142, *pl.* 40, *f.* 170), *but distinguished by its sculpture. It was well described and fairly enough delineated by Montagu, who introduced it as a Weymouth shell on the authority of Mr. Bryer.*

TRITON CUTACEUS, Linnæus.

Murex cutaceus, LINN. Syst. Nat. ed. 12, p. 1217. — BORN, Test. Mus. Vind. p. 299.—DILLW. Recent Shells, vol. ii. p. 697, not var.
Dolium, *&c.*, MARTINI, Conch. Cab. vol. iii. pl. 118, f. 1087.
Triton cutaceum, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 640. — TURTON, Mag. Nat. Hist. vol. vii. p. 352.—SOWERBY, Genera Shells, Triton, f. 3. — DESH. Encycl. Méth. Vers, vol. iii. p. 1032, pl. 414, f. 2. — PHILIPPI, Moll. Sicil. vol. i. p. 213; vol. ii. p. 184.—KIENER, Coq. Vivant. Trit. pl. 13, f. 1.—SOWERBY, Conch. Man. f. 399. — REEVE, Conch. Syst. vol. ii. pl. 244, f. 3; Conch. Icon. vol. ii. Trit. pl. 11, f. 39 (*cutaceus*).
Tritonia cutacea, TURT. Zool. Journ. vol. ii. p. 567.
Ranella tuberculata, RISSO, H. N. Europe Mér. vol. iv. p. 203, f. 123.
Tritonium cutaceum, BLAINV. Faune Franç. Moll. p. 115, pl. 4, B. f. 5.

A Mediterranean species introduced into our Fauna by Turton, as having been cast ashore in a worn state at Padstow and Guernsey.

DOLIUM PERDIX, Linnæus.

LISTER, Hist. Conch. pl. 984, f. 43.
Buccinum perdix, LINN. Syst. Nat. ed. 12, p. 1197. — PULTENEY, Hutchins, Hist. Dorset, p. 41. — MONT. Test. Brit. p. 244, pl. 8, f. 5. —MATON and RACK. Trans. Linn. Soc. vol. viii. p. 134.— RACK. Dorset Catalog. p. 44, pl. 15, f. 14. — TURT. Conch. Diction. p. 12.—WOOD, Index Testaceolog. pl. 22, f. 3.
Dolium, *&c.* MARTINI, Conch. Cab. vol. iii. p. 393, pl. 117, f. 1079.
,, *perdix*, LAM. Anim. s. Vert. (ed. Desh.) vol. x. p. 144.—FLEMING, Brit. Animals, p. 342. — Brit. Marine Conch. p. 213. — BLAINV. Faune Franç. Moll. p. 192, pl. 7, B. f. 2. — KIENER, Coq. Vivant. Dol. p. 4, pl. 5, f. 9; transl. Storer, p. 4. — REEVE, Conch. Icon. vol. v. Dol. pl. 6, f. 9.

Introduced by Pulteney, as from Weymouth. As some doubts exist about the identity of the American and Oriental specimens, it may be as well to observe, that the Jamaica form is the shell intended by our British writers.

PYRULA CARICA, Gmelin.

KNORR, Délices des Yeux, pt. 6, pl. 27, f. 1.—MARTINI, Conch. Cab. vol. iii. pl. 67, f. 744; pl. 69, f. 756.

Murex carica, GMELIN, Syst. Nat. p. 3545.—TURT. Conch. Diction. p. 86, f. 26. —DILLW. Recent Shells, vol. ii. p. 722.

Pyrula „ LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 505.—FLEMING, Brit. Anim. p. 347.—THOMPSON, Report Brit. Assoc. 1843, p. 257. — Brit. Marine Conch. p. 208. — DESH. Encyl. Méth. Vers, vol. iii. p. 866.—KIENER, Coq. Viv. Pyrula, pl. 3, f. 1.—GOULD, Invert. Massach. p. 296. — DEKAY, New York Moll. p. 141, pl. 9, f. 192, 193.

„ *Aruana*, REEVE, Conch. Icon. vol. iv. pl. 5, f. 16.

From the southern coast of the United States; introduced into our Fauna as Irish by Turton, who was deceived by the party from whom he procured it.

CASSIS.

Buccinum decussatum, PENN. Brit. Zool. ed. 4, vol. iv. pl. 79, bottom figures.

„ *bilineatum* (not of GMELIN, from LIST. Hist. Conch. pl. 998, f. 63, only), RACK. Dorset Catalog. pl. 17, f. 8 (copied from Penn.).

A young exotic Cassis, *in all probability an immature stage of the West Indian* testiculus (*Kiener, Coq. Vivant. Cas. pl.* 9, *f.* 17), *was introduced by Pennant as from Weymouth. Pulteney, who added it to his Dorset list, on the authority of Pennant* (*as* B. porcatum, *Hist. Dorset, Appx. p.* 41, *copied as* bilineatum *by Montagu, Test. Brit. p.* 244; *Maton and Rack. Trans. Linn. Soc. vol. viii. p.* 134; *Rack. Dorset Catal. p.* 44; *Turt. Conch. Diction. p.* 17; Cassis bilineata, *Brit. Mar. Conch. p.* 211), *appears to have described, as its adult state ("inner lip rugose and granulate"), a distinct species, possibly the* recurvirostrum *of Reeve's "Iconica."*

CONIDÆ.

To a person unacquainted with exotic, and at the same time unversed in fossil Conchology, the association of the fusiform shells, often called *Pleurotomæ*, with *Conus*, will appear unnatural. There is really a very complete passage between them and the true Cones, although the extremes of each have little besides the possession of a spire, and the canaliculated aperture in common. The animals are, however, very similar. In outward conformation they resemble those of the *Muricidæ*, but their dentition, as first shown by Lovén, is of an entirely different type. The presence or absence of an operculum in this tribe is so variable a character, that it might almost be termed capricious. The genus *Conus*, after which the group is designated, is a vast and beautiful assemblage of brilliantly coloured Mollusks, almost all now confined to the tropics, though during more ancient times several Cones inhabited the Britsih area.

MANGELIA. Leach.

Shell turriculate, fusiform, variously sculptured with spiral or longitudinal ribs or striæ, or both; sometimes smooth; spire produced. Aperture, with the outer lip more or less sinuous and retiring at its junction with the body-whorls, and inferiorly produced into a more or less elongated canal.

Animal with slender variously formed tentacula, converging at their inner bases, and bearing the eyes at various heights on external bulgings. Siphon produced beyond the canal of the shell; two branchial plumes. Proboscis retractile, tongue with a simple rachis, and a single series of subulate denticles, arming each lateral membrane. Male organ filiform. Foot ample, truncate in front, variously shaped behind. Operculum usually wanting; when present unguiculated with a terminal nucleus.

There is so much confusion of nomenclature about those mostly little fusiform British shells, commonly called *Pleurotomæ*, that we are obliged to redefine the genus in which they are here placed. The name *Mangelia*, as here used, is employed in the sense in which it would appear it was proposed by Leach and adopted by Risso. It is synonymous with *Defrancia* of Millet. The group differs from *Pleurotoma* proper (with which such of its species as possess opercula have that organ similar) in having a sinuosity of the outer lip at its junction with the body-whorl instead of a true marginal notch below the junction; and from *Clavatula* (as redefined by Gray) in having the same difference, and when an operculum is present that organ with an apical instead of a lateral nucleus. We divide the genus into two sections. 1st. Those with an operculum, receiving for this division the name BELA, and 2nd. Those which have no operculum, or MANGELIA proper. These divisions are, however, merely sectional, since, in the first, we find *Mangelia turricula* and its immediate relatives, forming a very natural little circle, associated with the very dissimilar *Mangelia septangularis*, whose affinities are rather with *costata* and the allied forms deprived of opercula. It is impossible from the shell alone to pronounce whether the animal be or be not provided with an operculum.

A. BELA.

M. (Bela) turricula, Montagu.

White or slightly tinged with rose-colour; whorls flat, abruptly and angulately scalar: no distinct labial sinus.

Plate CXI. fig. 7, 8, and (Animal) Plate T. T. fig. 2.

Murex turricula, Mont. Test. Brit. vol. i. p. 262, pl. 9, f. 1; Suppl. p. 115.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 144.—Rack. Dorset Catalog. p. 47, pl. 14, f. 15. — Turt. Conch. Diction. p. 93. — Dillw. Recent Shells, vol. ii. p. 744. — Wood, Index Testaceolog. pl. 27, f. 133.
„ *angulatus*, Donov. Brit. Shells, vol. v. pl. 156.
Fusus turricola, Fleming, Brit. Animals, p. 349.—Brit. Marine Conch. p. 201.
Pleurotoma turricula, Blainv. Faune Franç. p. 104.—Macgilliv. Moll. Aberd. p. 171.—Reeve, Conch. Iconica, vol. i. Pleurot. pl. 19, f. 162.
Fusus „ Hanley, Young Conch. p. 84. — Johnston, Berwick. Club, vol. i. p. 236. — Gould, Invert. Massach. p. 292, f. 193.
Defrancia nobilis, and *scalaris*, Möller, Index Moll. Grœnl. p. 12 (from types).
„ *Woodiana*, Möller, Index Moll. Grœnl. p. 13?
Pleurotoma Trevellianum (not of Turton), Macg. Moll. Aberd. p. 127?—Brown, Illust. Conch. G. B. p. 127, pl. 57, f. 1?
Fusus turriculus, Brown, Illust. Conch. G. B. p. 7, pl. 5, f. 51, 52. — Dekay, New York Fauna, p. 149, pl. 36, f. 340.
Pleurotoma rugulata, Reeve, Conch. Icon. vol. i. Pleur. pl. 37, f. 345 (probably).

There is no British shell with which this pretty species can be confused except *M. Trevelliana*, from which it not merely differs by the greater flatness of its whorls, and its longer and more strongly scalar spire, but also in the absence of a sinus from the outer lip.

It is of a somewhat fusiform oblong shape, rather strong, of an uniform pure white (more rarely pink or pale yellow), and neither shining nor transparent. The exterior is gracefully adorned with prominent and sharply pronounced narrow longitudinal ribs, or riblets, which are rather distant (at least are not so broad as their intervals) almost perpendicular, and, except perhaps about the angle, are not at all flexuous; they continue in full strength to the base of the smaller turns, but dwindle away upon the anterior part of the body-whorl, where they finally cease before the commencement of the caudal portion. Both ribs and intervals are alike crossed by numerous closely disposed spiral costellar lines, that are not much elevated, and are of rather irregular thickness. The whorls are peculiarly scalar, rising perpendicularly from the fine and simple suture, and being more or less abruptly and horizontally angulately flattened at their upper extremity; they are short, and of gradual longitudinal increase. The less abrupt is the scalar structure, the finer and less prominent are the ribs and striæ. The spire, which is composed of six or seven rather flat-surfaced turns, does not exceed the body in length, and tapers rather quickly to a fine point. The body which occupies about one half of the entire length, is rather quickly attenuated from the broad posterior extremity so as to form a right angled triangle; the base is a little produced. The narrow aperture is nearly as long as the spire above it; it is produced anteriorly into a rather broad and not much elongated canal, which bends up slightly at its extremity. The outer lip is acute, simple, and more or less angular in outline. The inner lip is subangulately incurved above, and straight below; the enamel is much spread on the columella, which is produced, and devoid of all sculpture. Fine examples measure three-quarters of an inch long, with a diameter of nearly the third of an inch.

A kind of spiral ridge frequently subtuberculates the ribs at the angle of the whorls.

The animal is white with a slightly yellowish tinge. Its head is rather small with short tentacula, nearly two-thirds of whose length is occupied by the thickened and eye pedicles; the terminal portion is subulate, and very short. The foot is large, and capable of considerable expansion, its anterior angles are obsoletely auriculated; its posterior extremity is broad, truncate, and often emarginate. The caudal portion of the foot extends considerably beyond the small ovato-pyriform operculum. The siphon is very long, and is often extended considerably beyond the head.

This species is generally diffused all round the British Islands; so much so, that to enumerate localities would be superfluous. It has a vast range in depth, extending from the laminarian zone, where it occurs in three or four fathoms water, to as deep as one hundred fathoms. This capacity for living under many bathymetrical conditions corresponds with its tendency to variation. It is essentially a northern shell, extending throughout the Arctic and Boreal seas, at both sides of the Atlantic, and apparently not ranging southwards beyond the Celtic region. It dates its history in our seas from the red crag epoch.

M. (Bela) Trevelliana, Turton.

White; whorls bluntly scalar; longitudinal riblets very small and crowded; body swollen; a distinct labial sinus.

Plate CXII. fig. 1, 2.

Pleurotoma sinuosa (not of Montagu), Fleming, Brit. Animals, p. 354 (from type).
,, *Trevellianum*, Turton, Mag. Nat. Hist. vol. vii. p. 351. — Brit. Marine Conch. p. 197, f. 52.
,, *reticulata*, Brown, Illust. Conch. G. B. p. 8, pl. 5, f. 29, 30.
decussata, Reeve, Conch. Iconica, vol. i. pl. 19, f. 159, as from type

of same in Macgilliv.* Moll. Aberd. p. 172, copied in Brit. Marine Conch. p. 198, and Brown, Illust. Conch. G. B. p. 127.
Pleurotoma leucostoma, Reeve, Conch. Icon. vol. i. Pleurot. pl. 31, f. 278.
„ *reticulatum*, Macgilliv. Moll. Aberd. p. 173 (copied, Brit. Marine Conch. p. 199), probably.

The general features of this shell present a striking similarity to those of *M. turricula;* yet the points of difference are sufficiently obvious to ensure its discrimination. It is of a narrow elliptic shape, and tapers nearly equally from the middle to either extremity. It is tolerably, but not very, strong, neither shining nor transparent, and of an uniform milk-white hue. Its external surface is decussated by spiral costellar lines, and very numerous narrow fold-like ribs; the former, which are densely disposed, and which for the most part (except towards the base of the body-whorl) are broader than their intervening sulci, are more or less flattened, and are chiefly conspicuous upon the lower half of the final volution, where the folds, which run from suture to suture down the turns of the spire, and are never abruptly prominent, are no longer apparent; they frequently, too, become obsolete towards the outer lip, or else become so fine as to form a kind of network with the revolving lines. The spire, whose apex is decidedly blunt, does not occupy more than two-fifths of the total length, and is composed of five or six short and slowly increasing turns, that are decidedly convex or rounded, yet subscalar above. Their angulation, however, is not horizontally abrupt as in *turricula*, but rounded off and much more shelving; upon the flattened area above it the spiral lines, when visible at all, are finer, and usually about three or four in number, and the ribs are often subdivided by longitudinal wrinkles. The body is somewhat ventricose posteriorly; its anterior attenuation is gradual and convex. No sculpture adorns the mouth, which fills more than one half of the ventral length. The acute margin of the outer lip, after its distinct, though shallow arched posterior emargination, advances with a swell, and again recedes rather quickly at the anterior extremity. The pure white enamel is widely spread over the inner lip, whose edge is sinuous, being incurved rather above the middle. The majority of specimens do not exceed a third of an inch in length, and two lines in breadth. The animal is unknown.

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* The description in Macgillivray (only derived, however, from two broken examples) does not agree correctly with this species, but applies better to the *T. muricatus*.

This is a rare and local species, a member of the boreal element of the British fauna. Its extra-British range is not fully known, but is probably in great part coextensive with that of *turricula*. In our seas it is very scarce. Scarborough (Bean) in seventeen fathoms, off Whitburn; Northumberland (Howse); Aberdeen (Macgillivray) off which coast it has been taken in from thirty to forty fathoms (Thomas); in fifteen fathoms, Eda Sound, Orkney (Thomas); in twelve and fifteen fathoms, Hebrides, and in fifty to sixty fathoms, Zetland, but dead (M'Andrew and E. F.); Deal Voe, Zetland (Jeffreys). As a fossil it occurs in the red and coralline crags.

M. (Bela) rufa, Montagu.

Coloured; whorls convex, not distinctly scalar; labial sinus very obscure, if present.

Plate CXII. fig. 3, 4, 5, and (Animal) Plate T.T. fig. 4.

Murex rufus, (not of Lam.) Mont. Test. Brit. p. 263. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 145. — Turt. Conch. Diction. p. 93.—Dillw. Recent Shells, vol. ii. p. 744.—Wood, Index Testaceolog. pl. 27, f. 134.—Fleming, Edinb. Encyc. pl. 205, f. 1 (badly).

Murex chordula, Turton, Conch. Diction. p. 94 (from type).
Fusus rufus, Fleming, Brit. Animals, p. 350. — Brit. Marine Conch. p. 204.— Brown, Illust. Conch. G. B. p. 7. — Gould, Invert. Massach. p. 290, f. 192.—Dekay, New York Moll. p. 146, pl. 9, f. 189.
Fusus chordula, Fleming, Brit. Animals, p. 351.
„ *pleurotomarius*, Couthouy, Boston Journ. Nat. Hist. vol. ii. p. 107, pl. 1, f. 9.
Pleurotoma nigra, Potiez and Mich. Gal. Douai, Moll. p. 446, pl. 35, f. 5, 6.
Defrancia Vahlii, Beck in Möller Index Moll. Grœnl. p. 13, probably.
Fusus fuscus, Brown, Illust. Conch. G. B. p. 6, pl. 5, f. 3, 4.
„ *Cranchii*, Brown, Illust. Conch. G. B. p. 6, pl. 5, f. 5.
„ *discors*, Brown, Illust. Conch. G. B. p. 6, pl. 5, f. 6, 7.
„ *castaneus*, Brown, Illust. Conch. G. B. p. 6, pl. 5, f. 43, 44.
„ *discrepans*, Brown, Illust. Conch. G. B. p. 6, pl. 5, f. 49, 50.
„ *albus*, Brown, Illust. Conch. G. B. p. 7, pl. 5, f. 62 ?
„ *minimus*, Brown, Illust. Conch. G. B. p. 6, pl. 5, f. 35, 36 ? ?
Pleurotoma Ulideana, Thompson, Ann. Nat. Hist. vol. xv. p. 316, pl. 19, f. 2.
„ *Vahlii*, Reeve, Conch. Icon. vol. i. pl. 36, f. 332, probably.

This species exhibits such diversity in shape (being at times stunted and broad, at other times narrow and produced), in the size, number, and diffusion of its ribs (which are, as frequently as not, entirely or partially obsolete on the body-whorl, and are sometimes few coarse and strongly projecting, sometimes finer rounded, or depressed, and more frequent), and in the profundity and conspicuousness of the spiral striæ, that it has been greatly subdivided by those writers whose opportunities of examining a large number of individuals of each species have been inferior to our own.

The shell is more or less strong and opaque, and both within and without of an uniform hue of brownish-purple, chocolate, rufous brown, or tawny orange : the former is the usual colour in living examples, but the dark hue gradually fades into reddish brown, even in those individuals which have been captured thus richly painted. Adult individuals are generally of an oblong-subfusiform shape, and composed of from seven to seven and a half volutions, of which the final one is, on the average, equal to, or nearly equal to, the rest united. The usual number of the longitudinal ribs ranges from ten to fifteen on each of the two principal turns; they extend from the top to the bottom of each volution, but are less thick and prominent posteriorly: they are sometimes much more remote than at other times, but are never very closely disposed, are frequently a little slanting or curved, and almost always, if not invariably, become obsolete upon the peaked anterior extremity of the body, where the basal declination is gradual but convex. The rather close and somewhat irregular revolving striæ are commonly less apparent beneath the simple, yet profoundly impressed suture; they traverse the entire shell, yet from their shallowness are more frequently (especially in at all worn examples) only perceptible in the intervals of the ribs. The spire tapers to a very blunt and more or less unsymmetrically coiled apex. The whorls are not scalar, though at times they shelve towards their upper suture in a somewhat subangulated fashion; they are convex or even slightly ventricose, of rather slow longitudinal increase, and, except in the elongated varieties, rather short than otherwise. The mouth occupies, on the average, four-ninths of the ventral length; filling in the produced forms a lesser proportion, in the broader abbreviated ones a greater proportion: it is of a narrow oblong form, angulated above, and tapering below into a rather short and broadish canal, the end of which is not abruptly truncated, but somewhat rounded. The outer lip, which is indented posteriorly by a rather short and very shallow sinus, is acute at the edge, and smooth internally: it is almost continuously arched, but does not project very much, and is neither reflected nor patulous. The edge of it advances a little in the middle, and is scarcely interrupted in its sweep by the retusion that precedes the formation of a canal. The incipient beak is scarcely at all recurved. The pillar lip is broadly reflected, and the longer portion, the lower end, of it is nearly straight. The breadth of an individual that measured rather more than half an inch in length, was two lines and a half.

In the large and greatly produced variety *Ulideana*, the aperture is small, and only occupies three-eighths of the total length; the ribs, which are usually few, distant, and slanting, are strong and remarkably prominent, and the suture is rather more oblique than usual. The type of this form (pl. CXII. f. 5), for the loan of which we are indebted to Mr. Thompson, is of a reddish orange-brown, with the spiral sculpture somewhat coarse, and the body scarcely filling one half of the dorsal length.

The animal is white. Its head is rather large and broad. The tentacula are linear and produced. Their apical portion is not equal to the thickened eye pedicles, and is somewhat clavate and obtuse; the eyes are placed on prominent bulgings at a little less than two-thirds of the height of the tentacle. The foot is wide, but not so expanded as in *turricula*. Its frontal margin is truncated and has the angles subauriculated; its caudal extremity is truncate and slightly emarginate. The operculum is borne very near the extremity. The siphon is produced much beyond the canal.

This shell is more common in the South than in the North, but has a wide diffusion. It is rarely taken in quantity. It ranges through the laminarian and upper part of the coralline zones, though seldom found alive deeper than twenty fathoms. It frequents gravelly ground. It is found sparingly all round the English and Irish coasts, more rarely on the shores of Scotland. We have taken it alive in ten fathoms in the Hebrides (M'Andrew and E. F.); it has also been taken in Loch Fyne (Barlee), and at Oban (Jeffreys). It would appear to be found on both sides of the Atlantic. We have found it among pleistocene fossils in Ireland.

M. (Bela) septangularis, Montagu.

Remarkably solid, of an uniform lighter or darker livid flesh colour; whorls with seven broad continuous longitudinal ribs, otherwise smooth: outer lip thickened.

Plate CXII. fig. 6, 7, and (Animal) Plate T. T. fig. 3.

Murex costatus, Pulteney, Hutchins, Hist. Dorset, p. 43. — Rack. Dorset Catalog. p. 46.

,, *septangularis*, Mont. Test. Brit. p. 268, pl. 9, f. 5; Suppl. p. 115.— Maton and Rack. Trans. Linn. Soc. vol. viii. p. 144. —Turt. Conch. Diction. p. 92.—Dillw. Recent Shells, vol. ii. p. 744. — Wood, Index Testaceolog. pl. 27, f. 132. — Clark, Annals Nat. Hist. 2nd ser. vol. vii. p. 113.

,, *septemangulatus*, Donov. Brit. Shells, vol. v. pl. 179, f. 4.

Fusus septangularis, Fleming, Brit. Animals, p. 350.—Brown, Illust. Conch. G. B. p. 7, pl. 5, f. 11.

Pleurotoma ,, Blainv. Faune Franç. Moll. pl. 4, f. 4. — Brit. Marine Conch. p. 196.—Kiener, Coq. Vivant. Pleurot. pl. 26, f. 3.—Philippi, Moll. Sicil. vol. ii. p. 169.—Reeve, Conch. Iconica, vol. i. Pleurot. pl. 25, f. 322.

,, *heptagona*, Scacchi, Notiz. p. 42, pl. 1, f. 9; Cat. p. 11 (teste Philippi).

The peculiar contour of this interesting species renders it easily recognisable. It is very solid, opaque, more or less shining, and of a lighter or darker livid flesh-colour, that is not variegated, but merely becomes paler on the ribs, so that in the more pallid examples they are white or nearly so; sometimes, too, there is a very obscure and undefined whitish band beneath the sutures. The shape is turreted above, bluntly and abbreviatedly semifusiform below. Each of the principal turns is adorned with seven subangular (yet often rounded by attrition) longitudinal ribs that traverse the spire in almost continuous lines, but do not extend to the lower half of the body-whorl. They are rather broad-based, usually swell out a little below, and are separated by concave intervals, that are wider than the ribs themselves; in very fine specimens the concavities are almost obsolete on the lower half of the penult turn. The surface, otherwise, seems smooth to the eye, but with a magnifying glass one descries most minute and densely disposed spiral striulæ pervading the entire exterior. A very fine and inconspicuous sutural line winds between the seven or eight peculiarly flat turns that compose the spire; these taper regularly and rather considerably above, are moderately high, of rather slow longitudinal increase, and terminate in a bluntish apex. In a peculiarly fine specimen, the body occupied three-sevenths only of the dorsal length, in general it is as long as the rest of the whorls united; it is moderately attenuated and somewhat compressed towards the base, where the declination is gradual and not much rounded; from the flatness beneath the suture there is often (especially in the more aged shells), a kind of gibbous subangulation near the middle. The mouth, which is devoid of sculpture, usually occupies about two-fifths of the ventral length; it is of an elongated oval shape that is contracted above to an acute angle, but is only narrowed slightly anteriorly, where it forms a rather broad and very short canal, that is neither recurved, nor leans to either side. The throat is quite smooth, and is often tinged with livid purple far within; but the more exposed portion of it, as well as the chief part of the pillar lip is usually of a whiter cast than the external colouring.

The outer lip, which is arched and very prominent, is guarded externally by a very stout varix-like rib, which attenuating anteriorly, gives a somewhat expanding look to the base, or lower extremity of the aperture; its posterior sinus is a mere indention, being rounded and very shallow. The inner lip is broad, and not very concave at its edge: the pillar lip is a little reflected. The largest example we have seen, measured nearly three-quarters of an inch in length, and was a quarter of an inch broad.

The animal (of which we have given a figure from a drawing by Mr. Alder) has been very fully described by Mr. Clark. It is white, with flaky specks. The head is compressed and narrow, with diverging tentacula, which are "short, setose, with the eyes on attached, thick offsets at the external points at about two-thirds of their length; the remaining portion is very short." The foot is rather short, rounded, and sometimes emarginate behind, subtruncate and sub-auriculated in front. The operculum is "strong, very elongated, oval, pale, corneous, and formed of unguiculated segments." Mr. Clark has associated this species with the true *Murices*, on what appear to us insufficient grounds. We have not been able to examine its teeth, but feel confident that the dentition will bear out our view of its position.

We have taken this species on the south and west coasts of England, in various depths of water, from five to thirty fathoms (E. F.); alive among rocks at Torbay, and dead at Weymouth (S. H.); Bristol Channel (Jeffreys); Clyde (Smith); Hebrides (Barlee); Frith of Forth (E. F.); on each side of Ireland (Thompson); Bantry and Galway (Barlee). It ranges to the Mediterranean, and is, probably, essentially a Lusitanian type.

B. MANGELIA.

M. nana, Lovén.

Pure white, devoid of longitudinal ribs; very closely sulcated in a spiral direction; whorls, simply ventricose; labial sinus very shallow.

Plate CXII. fig. 8, 9.

Tritonium nanum, Lovén, Index Moll. Scandin. (1846), p. 12.
Fusus albus, Forbes, Ann. Nat. Hist. (1847), vol. xix. p. 97, pl. 9, f. 3.

This delicate little shell, which looks not unlike a miniature *F. Islandicus*, has a fusiform shape, is somewhat glossy, very thin and transparent, and is of an uniform snow-white hue, both externally and internally. The principal turns are most densely encircled with numerous flat costellæ, whose intervals are traversed lengthway by most crowded minute raised lines, that are often most apparent beneath the suture (where the riblets are frequently further apart); so close are those costellæ that to the naked eye, or beneath a low magnifying power, the surface seems merely sulcated, or punctato-sulcated, in a spiral direction. The lines of growth are sometimes coarsely conspicuous upon the spire, which consists of four volutions, that are simply ventricose, or else are slightly more swollen anteriorly, are of moderate longitudinal increase, gently taper above, commence with a very blunt mammillary and unsymmetrically coiled apex, and are divided by a fine sutural line. The body, which decidedly exceeds the spire in length (at the least it occupies four-sevenths of the total length), is rather narrow, and though well rounded, is not much swollen; it gently attenuates anteriorly, with a rather gradual but very convex declination, to a short subcaudal extremity. The mouth, which is devoid of all sculpture, occupies about half the total length, has a somewhat oblong figure, that is contracted above to a sharp angle, and gradually attenuated below to a rather short canal. Little or no enamel is visible on the space between the two lips. The very sharp edge of the arcuated outer lip is retuse, or exhibits a small but distinct shallow sinus, at its posterior extremity. The straightish and greatly produced pillar, which curves slightly to the left, forms a more or less distinct rounded off obtuse angle, with the short and convex upper portion of the inner lip.

A fair sized individual that measured a quarter of an inch in length, was the eighth of an inch in breadth.

Lovén has a brief notice of the animal. According to him it has slender tentacles and teeth, characteristic of a true *Mangelia.*

This very rare and beautiful little shell, a member of our boreal fauna, was first taken at Lerwick by Mr. Jeffreys, and subsequently by Mr. M'Andrew and Professor Forbes, in forty-five fathoms water, between Fair Island and Zetland. Mr. Barlee has since met with it in several localities in the deep water around the Zetlands; and Lieut. Thomas has taken it off the Orkneys. It ranges to Finmark.

M. TERES, Forbes.

Destitute of longitudinal ribs, usually variegated; with rather large and prominent spiral ribs; whorls very deeply divided, the infrasutural area being retuse: labial sinus very profound.

Plate CXIII. fig. 1, 2, and (Animal) Plate R. R. fig. 3.

Pleurotoma teres, FORBES, Ann. Nat. Hist. vol. xiv. p. 412, pl. 10, f. 3.— FORBES in REEVE, Conch. Icon. vol. i. pl. 19, f. 161.
„ *boreale*, LOVÉN, Index Moll. Scandin. p. 14, probably.

This rare and beautiful shell has a turreted-fusiform shape, is more or less thin, a little glossy, and is spotted on a ground of yellowish white, with somewhat distant markings of chestnut brown, which are chiefly confined to the raised portions of the surface, on which they are disposed lengthways in irregular narrow wavy interrupted streaks. In place of longitudinal ribs, the sculpture consists of abruptly prominent close set spiral ones, which alternate in size and prominence; with these the body is densely encircled throughout; six are usually present on the penult turn, five on the antepenult volution, and so on. Both ribs and intervals (the latter mere broad furrows) are alike smooth, but a most crowded array of minute raised longitudinal wrinkles adorns the shallow canal (or retuse infrasutural area), which marks the former sites of the labial fissures, and is rather broad on the final coil. Owing to this slight canal, the whorls are very distinctly defined, though the sutural line is very narrow; the spire, which rather slowly acuminates to a very fine point, is composed of nine volutions, that are rounded below and taper above, are moderately high, and of ordinary longitudinal increase. Rather more than one half of the dorsal length is occupied by the rounded and somewhat ventricose body, which terminates below with a more or less sudden declination and attenuation, in a rather short but well-marked beak. The mouth, which is rather open, and of a sub-oval figure, that is broad above, and is contracted and produced below into a rather wide canal, fills about four-ninths of the total length. The throat is only furrowed by the external sculpture. The lateral outline of the rather projecting outer lip is remarkably arcuated; its edge is acute and simple, not being strengthened behind, even at a distance, by any rib or varix: its posterior fissure is not very broad at its opening, but is peculiarly long, the breadth continuing to be almost the same throughout. The inflection of the lip at the commencement of the canal is very slight. The columella, which is smooth, white, and moderately rounded, is tolerably straight, but leans a little to the left at its extremity. The length of the very fine example we have figured (from Mr. Jeffreys' incomparable collection) is three-fifths of an inch, and its breadth nearly three lines. The nucleus is a most beautiful object beneath the microscope, appearing to be fretted with a most delicate network of raised lines.

The animal is entirely white. The tentacula are long and subulate: the eyes are placed on very short bulgings at about a fourth of their length from their bases. The foot is very large, wide and expanded, truncated, and strongly auriculated in front, subtriangular behind. There is not a vestige of an operculum. The siphon is extended beyond the shell, as in others of its genus.

Although a very recent addition to the British Fauna, of which it was first announced as a member by Mr. M'Andrew, it has of late been taken in many localities, and at various depths from fifteen to one hundred fathoms. On the Cornish coast (where it has been found by Mr. Cocks, and Mr. Peach) it has been dredged in fifty fathoms; and on the Zetland seas frequently between thirty-five and one hundred fathoms (M'Andrew and E. F.). Off Northumberland it has been taken in seventeen fathoms (Howse); in fifteen and eighty fathoms, Orkneys (Thomas); in Loch Fyne, also on the coast of Galway in Ireland (Barlee). It ranges through the Mediterranean.

M. PURPUREA, Montagu.

Purplish brown, with scattered whitish speckles (more rarely pure white) cancellated (often spinosely so); throat with raised spiral lines; labial sinus very distinct.

Plate CXIII. fig. 3, 4, 5.

Murex purpureus, MONT. Test. Brit. p. 260, pl. 9, f. 13. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 148.—TURT. Conch. Diction. p. 94. — DILLW. Recent Shells, vol. ii. p. 745. — WOOD, Index Testaceol. pl. 27, f. 137.

Mangeleia purpurea, RISSO, Hist. Nat. Europe Mérid. vol. iv. p. 222.

Fusus purpureus, FLEMING, Brit. Animals, p. 351. — FORBES, Malac. Monens. p. 26, animal.—Brit. Marine Conch. p. 205, f. 95.—BROWN, Illust. Conch. G. B. p. 7, pl. 5, f. 25.

Pleurotoma Philberti, MICHAUD, Bullet. Linn. Soc. Bordeaux, 1829, vol. iii. p. 261 (and Esp. Nouv. Coq. Vivant. 1829, p. 2), pl. 3, f. 2, 3.—KIENER, Coq. Vivant. Pleur. p. 72, pl. 24, f. 4. —PHILIPPI, Moll. Sicil. vol. ii. p. 165.—REEVE, Conch. Icon. vol. i. pl. 16, f. 129.

„ *purpurea*, BLAINV. Faune Franç. Moll. pl. 4, f. 10.—KIENER, Coq. Vivant. Pleur. p. 71, pl. 25, f. 3.—REEVE, Conch. Icon. vol. i. Pleur. pl. 16, f. 136.

„ *versicolor*, SCACCHI, Fauna del Napoli, p. 12, f. 19.

„ *variegatum*, PHILIPPI, Moll. Sicil. vol. i. p. 197, pl. 11, f. 14.— JEFFREYS, Ann. Nat. Hist. vol. xix. p. 311.

Fusus asperrimus, BROWN, Illust. Conch. G. B. p. 8, pl. 6, f. 2, from type.

Of this richly sculptured shell we have two forms, one, and by far the rarer one, large, ten-whorled, and with twenty-two longitudinal ribs on the penult turn; the other, the ordinary littoral type (exactly the *Philberti* of Philippi's "Enumeratio"), small, eight-whorled, and with generally only fifteen or sixteen ribs on each volution.

The colour of the species, which is moderately strong, and has a somewhat fusiform-turreted shape, and but little lustre, is a violet-brown (changing after death to rufous or livid-colour), that is more or less marked with small scattered patches of dirty white, and is sometimes, yet rarely, adorned with an indistinct and irregular pallid zone near the middle of the body-whorl. The surface is somewhat nodosely decussated (at times almost cancellated) by the abruptly prominent longitudinal ribs being surmounted by acutely erect spiral lines. The former are not so broad as their intervals, and are often a little aslant; the latter are more closely disposed than the costæ (hence the lattices are broader than long) and increase in number in proportion to the frequency of the ribs; in the littoral form there are usually but five at most on the penult volution; the sculpture becomes granose on the rudimentary beak. The whorls, whose longitudinal increase is gradual but not slow, are profoundly and rather abruptly divided by a rather slanting suture, gradually lessen to an extremely acute apex, but do not taper much above; they swell out with some slight angularity beneath the suture, where a narrow space (the seat of the successive emarginations) is comparatively free from sculpture, and are rounded or even ventricose, though more conspicuously so in the large variety (in which from the increased number of whorls the spire is slightly longer than the fig-shaped body) than in the smaller form, where the converse for the most part holds good. The basal declination is rounded, and the anterior extremity is attenuated to a moderately narrow but not elongated beak. The aperture, which fills about three-eighths of the entire length, is of an oblong-elliptic shape, being much contracted by an internal thickening of the outer lip: it is contracted and produced below in a shortish but well marked canal, the commencement of which is clearly indicated by the abrupt termination of the much rounded simple arch of the outer lip. The throat, which either partakes of the external colouring, or is of a livid purple hue, is guarded at its entrance by numerous raised sulci, usually from seven to fourteen, the larger number in the more closely ribbed forms. The posterior sinus of the right lip, the white margin of which is bevelled to a sharp edge, and is a little jagged by the external sculpture, is narrow and short, yet distinct from its abruptness. The columella is well rounded, and not much curved or sinuated.

Figure 5 of Plate CXIII. represents the *F. asperrimus* of Brown, which we regard as an albino variety of this variable species. It is devoid of colour, exhibits a larger and more prickly style of cancellation, there being but fourteen or fifteen longitudinal ribs on the principal turns, and has its whorls rather more flat-topped than usual. In sculpture it approaches the *reticulata* * of Philippi, but is much more produced, slender, and rostrated than are his typical examples of that shell. We have received this form from Cornwall (Cocks), and Cork Harbour (Humphreys).

The animal, a fine example of which we have had an opportunity of examining when dredging off the Isle of Man, is white with flaky specks, the siphonal tube only being slightly tinged with purple. Its tentacula are rather long and subulate, their thickened eye-bearing portions occupying two-thirds of their length. The foot is ample, truncated and auriculated in front, triangular and rather pointed behind. There is no trace of an operculum.

This species is distributed generally on the western and southern sides of the British Isles, but sparingly and more abundant possibly in the south than in the north. It is not a gregarious shell. It inhabits all depths of water from three to sixty or seventy fathoms. It is not uncommon in the Zetland seas, though not recorded among Norwegian species. Southwards it ranges to and through the Mediterranean, where it is a very common shell.

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* We are disposed to believe that the *Pl. Cordieri* of PAYRAUDEAU (Moll. Corse, p. 144, pl. 7, f. 11; KIENER, Coq. Vivant. pl. 24, f. 1.—*P. rudis*, SCACCHI, Fauna del Napoli, p. 12, f. 17.—*Pl. purpurea*, PHIL. Moll. Sicil. vol. ii. p. 165), and possibly, also, the *P. reticulata* of RENIERI (PHILIPPI, Moll. Sicil. vol. i. p. 196; vol. ii. p. 165.—REEVE, Conch. Icon. vol. i. Pleur. pl. 15, f. 122) are only coarsely sculptured varieties of this beautiful shell. We have not as yet, however, observed these forms on our own coasts.

M. Leufroyi, Michaud.

White, with one or two bands of brownish splotches (never lineated with brown); decussated by numerous longitudinal ribs, and peculiarly dense fine spiral raised threads; mouth nearly equal to spire; throat smooth; labial sinus small, but distinct.

Plate CXIII. fig. 6, 7, and (Animal) Plate R. R. fig. 1.

Pleurotoma Leufroyi, Michaud, Bullet. Soc. Linn. Bordeaux, vol. ii. (1828), p. 121 (copied, Férus. Bull. Sciences Nat. vol. xvii. p. 308), f. 5, 6. — Kiener, Coq. Vivant. Pleur. pl. 24, f. 3. — Philippi, Moll. Sicil. vol. ii. p. 165. — Reeve, Conch. Icon. vol. i. pl. 16, f. 131.

„ *inflata*, Philippi (as of Cristof. and Jan.), Moll. Sicil. vol. i. p. 197, pl. 11, f. 24.

Fusus Boothii, Smith, Mem. Werner. Soc. (1839), vol. viii. pt. 1, p. 98, pl. 1, f. 1. — Brown, Illust. Conch. G. B. p. 127, pl. 57, f, 12.

Pleurotoma Boothii, Brit. Marine Conch. p. 196.

The characters of this shell approximate closely to those of the preceding species; it is however larger, has more crowded sculpture, and a different style of painting.

The individuals met with on our own coast have a more produced form than the typical specimens of the Mediterranean. They are of a somewhat acuminated oblong-fusiform shape, not very strong, but little shining, and variegated, on a ground of yellowish-white, with small splotches of brown, that are most frequently disposed upon the body-whorl in two irregular zones, the upper one of which is continued likewise upon the smaller turns. This colouring is wholly or partially obsolete upon the Zetland examples, which are almost entirely white. In decussated sculpture and rounded whorls it resembles *linearis*, but the raised spiral striæ (occasionally dotted with very short brown lines, but never painted throughout as on that shell) are more numerous, and much closer, as the interval between each of the larger ones is filled up by a finer stria. The ribs, which are often a little oblique, vary considerably in number and projection; the majority of our native specimens having as many as fifteen or sixteen rather depressed costæ on each of the two principal turns, whilst some of the foreign ones are only provided with ten abruptly elevated ones on any volution. The body is more or less ventricose, and occupies quite one half of the total length; it is more or less gradual in its basal attenuation, and ends in a rather broad beak: the basal declination is well-rounded. The shape of the mouth, which is almost as long as the spire, and ends in a rather open canal, is oval oblong; near the outer lip, which is prominent and greatly arcuated (in our native specimens it is disposed to expand, and is rarely if ever thickened by an external rib), it is white but occasionally is stained further inwards with livid purple: the throat is quite smooth. The labial sinus is small but distinct. The largest example we have ever seen, measured eleven lines in length, and four and a half lines in breadth.

The animal is white, sometimes slightly tinged with purple. Its tentacula are long and slender, their thickened eye-bearing portions extending for only about a third of their lengths. The foot is very large and expanded, truncated and strongly auriculated in front, produced and pointed behind, exhibiting the appearance of having a mentum, but showing no traces of an operculum. The siphon is of the usual length in this genus.

This species was first described as British by Mr. Smith of Jordanhill, who dredged it off Arran. It has been since taken in numerous localities in the Hebrides and Zetlands, in various depths from five to fifty fathoms; the finest specimens usually from the laminarian zone, and among the stems of *Laminariæ* (M'Andrew and E. F.). In fifteen fathoms, Eda Sound, Orkneys (Thomas). It has been taken in Ireland (Thompson); on the Galway coasts (Barlee); and Cork (Humphreys). Guernsey (Metcalfe). On the east coast of England it has been taken at Whitburn by the Rev. G. C. Abbes (Alder). It ranges along the coasts of Spain into and through the Mediterranean. A specimen dredged off Gibraltar by Mr. M'Andrew, is identical with the usual British form.

M. linearis, Montagu.

Turreted-oblong, longitudinally ribbed, white, with more or less strong spiral raised (and usually brown) threads; apex often purple; mouth not very much shorter than spire; throat indistinctly crenated; labial sinus almost obsolete.

Plate CXIV. fig. 1, 2, 3, and (Animal) Plate R. R. fig. 6.

Murex linearis, Mont. Test. Brit. p. 261, pl. 9, f. 4; Suppl. p. 115.—Maton, and Rack. Trans. Linn. Soc. vol. viii. p. 148.—Turt. Conch. Diction. p. 94. — Dillw. Recent Shells, vol. ii. p. 745. — Wood, Index Testaceolog. pl. 27, f. 136.

„ *elegans*, Donov. Brit. Shells, vol. v. pl. 179, f. 3.

Pleurotoma lineare, Fleming, Brit. Anim. p. 350.—Brit. Marine Conch. p. 197. —Philippi, Moll. Sicil. vol. ii. p. 166.

„ *A* . . . . Costa, Test. Sicil. p. 88, no. 21 ?

„ *concinna*, Scacchi (1836), Cat. Conch. Neapol. p. 12, f. 18 (teste Phil.).

„ *linearis*, Kiener, Coq. Vivant. Pleurot. p. 73, pl. 25, f. 4.—Reeve, Conch. Icon. vol. i. Pleur. pl. 33, f. 296.

Fusus linearis, Johnston, Berwick. Club, vol. i. p. 236.—Brown, Illust. Conch. G. B. p. 6, pl. 5, f. 54.
„ *Buchanensis*, Maccilliv. Moll. Aberd. p. 170? (copied, Brit. Marine Conch. p. 202).
Pleurotoma scabrum, Jeffreys, Ann. Nat. Hist. vol. xix. p. 311.

Of this pretty species we have figured the three principal varieties, the purple-tipped (*var. scabra*), the blunt-ribbed (*var. intermedia*), and the colourless form (*var. pallida*). Our description is drawn up chiefly from the first, or southern (and we conceive typical) form; the aberrations from which are specified in our notice of the two other varieties.

The shell has an oblong-turreted form, is moderately strong, and is spirally lineated with brown on a whitish ground. These coloured lines are often interrupted, and always seated on the threads or raised striæ that revolve around the shell, and render the surface more or less rough and prickly where they surmount the prominent longitudinal ribs. These last extend throughout the shell, running from suture to suture, are usually narrower than their intervals, and average from nine to thirteen on the two principal volutions: of the threads there are from four to six (usually five) on the penult, and twice that number on the body-whorl. The spire, which tapers rather quickly to a more or less acute point, and is stained with violet or purple near the tip, is composed of six or seven turns, which, although separated from each other by only a fine suture, are well defined from their roundness (particularly the penult whorl): they are sometimes, too, a little scalar. The body is about as long as the spire, is more or less ventricose above, but rather quickly attenuated to a shortish but well pronounced beak, that is narrow and scarcely at all recurved: the basal declination is convex. The mouth, measured from the posterior edge of the outer lip, occupies about three-sevenths of the total length, and is of a suboval form, that is produced below in a somewhat curved and not very short canal: its size is narrowed in adult examples by the thickening of the outer lip, which latter is much arcuated, the swell ceasing abruptly in front at the commencement of the beak. The labial sinus is small and only perceptible in mature individuals; it is not usually so conspicuous or profound in our native as in Mediterranean examples. The mouth is sometimes white, but more frequently is stained with purple, either wholly or partially. The throat is guarded by some tubercular crenæ (occasionally produced in short lyræ), but these are often indistinct; when perceptible, there seems a group of about seven small approximate ones, and a larger solitary one just below the posterior sinus. The pillar is more or less rounded, straightish, and somewhat elongated. No violet or purple adorns the mouth or apex of the variety *intermedia;* where the sculpture is not so rugged, the ribs being more delicate and rounded (usually, too, more numerous), and the threads, which are almost uninterruptedly brown, rather closer and finer. The whorls are still more rounded, hence the general shape is somewhat abbreviated: the mouth broader, and the canal shorter. The variety *pallida* is essentially northern: it is more or less devoid of colouring, has still finer closer and less elevated sculpture, and is even more produced in shape than the richly tinted and prickly southern variety.

The larger examples measure five lines and a half long, and two lines and a half broad.

The animal is entirely white. The tentacula are subulate, linear, and obtuse: the eyes are placed on their thickened portions, at rather more than a third of their lengths from their bases, which are more separated than is usual in the genus. The foot is large, very long, wide in front, truncated and strongly auriculated, pointed behind, and exhibiting no traces of an operculum.

This pretty species frequents sandy and shelly bottoms in various depths of water from the commencement of the laminarian zone to as deep as eighty fathoms. It is so generally distributed all round our shores, and from one extremity of the British Isles to the other, that we need not enumerate localities. It has a range from Norway to the Mediterranean.

M. GRACILIS, Montagu.

Large, brown, with a white fillet upon the body-whorl, with fine spiral grooves, and about twelve rounded longitudinal ribs: spire scarcely longer than the mouth; outer lip acute at the edge, with a deep sinus.

Plate CXIV. fig. 4, and (Animal) Plate R. R. fig. 8.

Murex gracilis, MONT. Test. Brit. vol. i. p. 267, 586, pl. 15, f. 5, Suppl. p. 115. —MATON and RACK. Trans. Linn. Soc. vol. viii. p. 143.—RACK. Dorset Catalog. p. 46, pl. 14, f. 18. — TURT. Conch. Diction. p. 90. — DILLW. Recent Shells, vol. ii. p. 742. — WOOD, Index Testaceolog. pl. 27, f. 127. — CLARK, Annals Nat. Hist. 2nd Ser. vol. vii. p. 121.

„ *emarginatus*, DONOV. British Shells, vol. v. pl. 169, f. 2.

Pleurotoma gracilis, FLEMING, Brit. Animals, p. 355. — Brit. Marine Conch. p. 195, f. 40. — BROWN, Illust. Conch. G. B. p. 7, pl. 5, f. 16, 17 (badly).—HANL. Young Conch. p. 80.—PHILIPPI, Mol. Sicil. vol. ii. p. 166.

„ *Comarmondi*, MICHAUD, Bullet. Linn. Soc. Bordeaux, vol. iii. (1829), p. 263 (and Esp. Nouv. Coq. Viv. 1829, p. 4), f. 6.—KIENER, Coq. Vivant. Pleurot. pl. 24, f. 2.

„ *suturalis*, PHILIPPI, Moll. Sicil. vol. i. p. 197.—REEVE, Conch. Icon. vol. i. Pleurot. pl. 7, f. 50.

„ *sinuosum*, (not *Murex sinuosus* of Mont.) COUCH, Cornish Fauna, pt. 2, p. 60.

„ *vulpecula*, DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. ix. p. 359.

Fusus elegans, BROWN, Illust. Conch. G. B. p. 8, pl. 6, f. 3.

„ *Branscombii*, CLARK, Ann. Nat. Hist. new ser. vol. iv. p. 425 (YOUNG).

This handsome shell is of a turreted fusiform shape, moderately thick, not much shining, and of a fawn-coloured or chestnut hue, that is varied on the body-whorl by a narrow medial whitish fillet (beneath which the surface becomes more intensely brown, so as to appear obscurely banded with that colour), that is rarely, if ever, continued upon the smaller volutions. The surface too is often darker beneath the very fine suture, where it is hollowed out a little, and is not crossed by the more or less prominent and somewhat rounded paler ribs (of which there are about twelve on the penult turn), that elsewhere traverse the shell in a longitudinal direction. These last, whose concave intervals are broader on the lower turns than the ribs themselves, are somewhat oblique, especially on the body, where, for the most part, they gradually cease a little below the middle. The entire exterior is densely grooved, likewise, in a spiral direction, the sulci being converted into close-set striæ on the concave infra-sutural area. The spire, which is about as long as the body, gradually tapers to a very fine point; it is formed by nine volutions, that are more or less rounded, of moderate longitudinal increase, and of tolerable (but not peculiar) height. The basal declination of the body, which, moderately ventricose above, attenuates anteriorly into a rather shortish somewhat twisted and scarcely recurved beak, is gradual but very convex. Nearly one half of the ventral surface is filled by the aperture, which is of an oblong-oval form, that is produced below into a canal, which is usually somewhat curved, rarely quite straight, and almost as long as the more open portion. The throat is smooth, and does not depart from the external colouring. A short but strongly marked sinus distinguishes the posterior extremity of the projecting and moderately arcuated outer lip, which, although strengthened a little distance behind by a varix-like rib, is acute at the edge, where it is finely jagged by the external sulci. This thin portion, which advances in the middle, but recedes again at the base, gives a greater apparent depth to the upper sinus. The pillar is rounded, devoid of sculpture, and tolerably perpendicular, there being no marked concavity in the middle of the inner lip. A magnificent specimen from Bray measured an inch and a half (Barlee), but ordinary examples are only ten lines and a half long, and three lines and a half broad.

A pretty variety in Mr. Jeffreys' collection is encircled by an interrupted brown line, that winds between the ribs immediately below the concave area.

We have figured the animal from a drawing by Mr. Alder ; a detailed description of it has been published by Mr. Clark. It is of a general white hue, with fleshy specks and numerous minute pink lines and dots, so as to give the body and siphon in many examples a general rosy tint. The tentacula are short and thick, with the eyes borne on their thickened portions at less than a third of their lengths from the tip ; their bases are set rather apart. The foot is ample and lanceolate, pointed behind, truncate and obtusely auriculated in front. This creature secretes an indigo blue fluid, with a garlicky odour (Alder).

This is one of our more southern forms, becoming more and more rare as we proceed northwards, and probably absent from the east coast. It is abundant in the coralline zone at Exmouth (Clark), and rather common at Torquay (S. H.) We have met with it dead in thirty fathoms on the Devonshire coast, and alive in twelve fathoms among stones and mud on the north and south

Welsh coasts (M'Andrew and E.F.); Caermarthen Bay (Jeffreys); Guernsey (Barlee); Clyde in fifteen to twenty fathoms (M'Andrew); a slender variety in Loch Fyne (A. M'Nab); Portmarnock and Bray in Ireland, but very rare (Thompson); Arran Islands, Galway (Barlee). It ranges to the Mediterranean.

M. NEBULA, Montagu.

Turreted-fusiform, very finely decussated by longitudinal and spiral striulæ; ten or eleven ribs on each of the final volutions; colouring uniform or banded, not lineated; spire almost twice as long as the mouth; throat smooth; lip never thickened; labial sinus quite obsolete.

Plate CXIV. figs. 7, 8, 9, and (Animal) Plate R. R. fig. 7.

Murex nebula, MONT. Test. Brit. p. 267, pl. 16, f. 6.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 143. — RACK. Dorset Catalog. p. 46, pl. 14, f. 16.—TURT. Conch. Diction. p. 92. — DILLW. Recent Shells, vol. ii. p. 743. — WOOD, Index Testaceolog. pl. 27, f. 129.

Mangelia Ginnania, RISSO, H. N. Europe Mérid. vol. iv p. 220, f. 99 ? ?

Fusus nebula, FLEMING, Brit. Animals, p. 350. — Brit. Marine Conch. p. 203, fig. 93.—BROWN, Illust. Conch. G. B. p. 7, pl. 5, f. 10.—JOHNSTON, Berwick. Club, vol. i. p. 236 (probably).

Pleurotoma nebula, BLAINV. Faune Franç. Moll. pl. 4, f. 3, probably. — REEVE, Conch. Icon. vol. i. Pleur. pl. 23, f. 198.

„ *Bertrandii*, PHILIPPI (not Payraud.), Moll. Sicil. vol. i. p. 168, pl. 11, f. 20 (not vol. ii.)

„ *lævigatum*, PHILIPPI, Moll. Sicil. vol. i. p. 199, pl. 11, f. 17, and vol. ii. p. 169 (from type). — THOMPSON, Ann. Nat. Hist. vol. xviii. p. 384.—KIENER, Coq. Vivant. Pleurot. pl. 27, f. 2.

„ *Ginnanianum*, PHILIPPI, Moll. Sicil. vol. ii. p. 168, pl. 26, f. 6. — JEFFREYS, Ann. Nat. Hist. (1847) vol. xix. p. 312.

Fusus pyramidatus, BROWN, Illust. Conch. G. B. p. 7, pl. 5, f. 8, 9 ?

Mangilia nebula, LOVÉN, Index Moll. Scand. p. 13 ?

Mangelia „ REEVE, Conch. Icon. vol. iii. pl. 6, f. 45.

Clavatula „ SEARLES WOOD, Crag Mollusca, p. 60, pl. 7, f. 10 ?

Of this pretty shell there are three principal variations, which many collectors, of late years, have regarded as distinct species. Of these we shall first describe the common rugged form, which is taken from a rough bottom, and then indicate those points alone by which the smoother and more elegantly coloured varieties differ from it.

The shell is moderately strong, a little glossy, and either of an uniform dark brown (rufous when dead) or with the elevated portions of its surface paler, and the depressed parts of a darker tint. The shape is turreted-fusiform, the form being attenuated at both extremities, but more quickly and bluntly so anteriorly, more slowly and acuminately so posteriorly, where the spire tapers to a very fine point. Numerous fine raised spiral lines (that are not microscopic and densely disposed as in *costata*) traverse the entire surface of the shell, and these are again partially decussated by some fine and crowded longitudinal wrinkles, that are peculiarly oblique, and are most apparent beneath the sutures. Ten or eleven longitudinal somewhat flexuous pliciform ribs, whose intervening depressions are about equal in extent, adorn each of the two or three principal volutions; they are not abruptly prominent, but rather broad based and laterally shelving, are least developed above, project and widen below; and often become somewhat obsolete towards the basal extremity of the shell where the spiral sculpture is most marked. The spire, which is half as long again as the body, is composed of nine or nine-and-a-half coils, the larger ones of which are a little retuse below the extremely fine suture, and swell out moderately below; they are not peculiar either for height or volutional increase. The body is not ventricose, but merely moderately convex; it forms a rudimentary tail at the bottom of its quick but not planulate basal declination. The colouring of the narrow aperture, which occupies from one-third to two-fifths of the ventral length is the same as that of the exterior; the pillar is often even darker, being livid brown or chocolate, especially at the base: the throat is quite smooth. The outer lip is simple acute, moderately arched, and rarely (if ever) strengthened by a rib (consequently the mouth is not so contracted as in *costata*, and *striolata*); its posterior sinus, which is slightly and bluntly subangular, is rather faintly indented. The upper portion of the inner lip unites with the columella at a very obtuse angle; the pillar itself is rather elongated, devoid of sculpture, and for the most part perpendicular; but at the commencement of the short and rather broad canal (the latter indicated chiefly by a slight straightening of the right lip) it bends a little to the left. Seven lines in length and two in breadth, were the dimensions of our largest individual of this form.

The variety *pyramidata* is a rare shell, which combines the turreted shape of the form just described, with the smoother sculpture and, oftentimes, the colouring of the succeeding one. The ribs are more rounded than in the last; the shell is considerably larger (measuring at times three-quarters of an inch long, and nearly a third as much in breadth), and of a white hue, adorned in the intervals of the ribs, except beneath the suture, with a very broad band of chestnut or rufous. Both the base of the body-whorl, and the entire columella, are generally white.

A third of an inch is the full length of the variety *lævigata*, which has usually a whorl or two less than the forms just described, and whose spire is, consequently, not so much, if at all, longer than the body (on this point, however, it varies in different specimens). It is coloured by alternate zones of whitish and brown (the latter of many tints, as chocolate, fawn-colour, &c.), that shade into each other, and are so disposed, that, for the most part a pale band revolves above the middle of the body-whorl, and is continued below the middle of the smaller volutions, whose two edges are both tinged with the darker hue; a second pallid zone, likewise, is occasionally present towards the anterior extremity of the shell: sometimes the whiteness is confined to the central portion of the ribs alone. These last are less prominent and less flexuous than in the first variety, and often become partially obsolete on the lower half of the body-whorl. The base of the pillar has often a livid or chocolate cast.*

The animal is of a general white or yellowish-white hue, speckled with flaky yellowish dots. The tentacula are rather short, clavate at their tips, thickened by the connate eye-pedicles for nearly two-thirds of their lengths, with the part on which the eyes are borne rather prominent and bulging. Their bases diverge at an obtuse angle. The foot is truncate, and subauriculated in front, obtuse and emarginate behind. The siphonal tube had often, in the examples we have examined, a very dark margin. There is no trace of an operculum. We have observed considerable variations in the soft parts of this species. Mr. Clark remarks that the eyes appear larger, and the tentacula proportionately shorter in var. *nebula* than in var. *Ginnaniana*, and that the ground colour is of a very pale yellow brown in the latter form.

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* Montagu's specimen of his obscure *M. proximus* (Test. Brit. Suppl. p. 118, pl. 30, f. 8, from which Turt. Conch. Diction. p. 93; Dillw. Recent Shells, vol. ii. p. 744; Wood, Index Testac. pl. 27, f. 31; *Fusus proximus*, Fleming, Brit. Anim. p. 349; Brit. Marine Conch. p. 202; Brown, Illust. Conch. G. B. p. 7, pl. 5, f. 34) is only the young of this species. His observation, that the lip is remarkably broad and reflected, is not, however, applicable to this species. The description is very brief, and runs as follows:—

"Shell thick, white, with six strongly costated spires; apex moderately pointed: aperture ovate oblong; outer lip remarkably broad, and reflexed; the canal short and remarkably spreading at the end. Length nearly half an inch. Found by Mr. Laskey on Tyningham sands, near Dunbar, and is extremely rare."

Montagu further remarks, that it looks very like *costatus*, but has eleven narrow ribs on the body-whorl. Of our British shells the *M. striolata*, perhaps, approaches the nearest to these characters, but we suspect that Montagu drew up this description from a foreign shell.

The various forms of this species are distributed sparingly around the British islands. Specimens are seldom abundant, yet the localities are so generally diffused that there needs no detailed enumeration. The variety *Ginnaniana* is most abundant at Tenby; *lævigata*, a much rarer shell, is taken on several parts of the south coast of England; the very rare form *pyramidata* occurs, chiefly dead, at Herm, near Guernsey (S. H.). It lives usually on muddy gravel, at various depths between five and fifty fathoms. It ranges from the North sea to and through the Mediterranean. It occurs, fossil, in the red crag.

M. BRACHYSTOMA, Philippi.

Very small, pale, brownish, with strong longitudinal ridges, and fine raised spiral threads; mouth scarcely filling more than a third of the length; throat smooth.

Plate CXIV. figs. 5, 6, and (Animal) Plate R. R. fig. 2.

Pleurotoma brachystoma, PHILIPPI, Moll. Sicil. vol. ii. p. 169, pl. 26, f. 10 (from types). — THOMPSON, Ann. Nat. Hist. vol. xviii. p. 384 (no description).—JEFFREYS, Ann. Nat. Hist. vol. xix. p. 311 (no description).

Mangilia tiarula, LOVÉN, Index Moll. Scandin. p. 14 (from type).

Clavatula brachystoma (fossil), SEARLES WOOD, Crag Mollusca, p. 60, pl. 7, f. 8.

This little shell has a turreted subfusiform shape, is not very strong, nearly opaque, not much shining, and is either of an uniform pale warmish brown tint, or is adorned upon a ground of that colour with a darker zone near the base of the body-whorl. The surface is coarsely roughened by strong and highly projecting rather distant longitudinal ridges (of which there are eight or nine on the body-whorl), and by revolving thread-like elevated lines, that traverse alike the ridges and their broader concave intervals. The ridges continue to the base of the body, and extend, although in diminished volume, towards the suture, from top to bottom of the principal coils. The first of the spiral threads, of which there are usually four more conspicuous ones on the principal turns of the spire (the exact number seems to vary, there being, according to Lovén, from fifteen to seventeen upon the body, and six or seven on the penult volution) runs immediately beneath the fine and wavy sutural line; they are minutely and densely squamiferous, the scales being caused by the passage over the spiral threads of most densely disposed microscopic lamellæ, that run parallel to the perpendicular ridges. Under a high magnifying power very many still more minute revolving series of scales may be perceived upon the body-whorl. The spire ends in a small but not acute apex, and is about half as long again as the body; it is composed of seven volutions, that are of moderate height, rather slow longitudinal increase, and somewhat square-cut, being more or less angulated above, not much rounded in the middle, and shelving in a little below. The body is peculiarly small, and is not at all ventricose, but almost immediately commences attenuating to a short canal, that does not lean to either side. The mouth, which in fully matured examples occupies but little more than a third of the total length, is very narrow, especially anteriorly; the throat is quite smooth, and is occasionally stained with a darker brown than the external tint. The outer lip is sharp, simple, jagged at the edge by the spiral threads of the exterior, scarcely projecting, little curved, and not at all expanded. The posterior sinus, though rounded and rather shallow, is still perceptible in the finer examples. The pillar, which bends slightly to the left, and is not apparently marked with any sculpture, occupies more than one half of the inner lip, on which latter the enamel is but thinly diffused.*

The largest specimen we have seen did not measure much more than a quarter of an inch, with a breadth of only a line and a half.

We have figured the animal from a living example taken off Skye. It was white, speckled with opaque purplish-white flakes. The head is rather small, with very short, thick, obtuse and clavate tentacula, bearing very large eyes on bulgings rather more than half way towards their tips. The peduncle of the foot is long and narrow; the foot itself as long as the shell, lanceolate, tapering behind, but truncate and emarginate at the extremity of the tail, obtusely angulated and bilobed in front. There is no trace of an operculum. The creature was very active.

This is a rare shell, yet probably widely distributed. On the English coast it has been taken in fifty fathoms off Cornwall (M'Andrew); at Torbay (Battersby); Exmouth (Clark); Whitburn, Northumberland (Alder); in various localities in the Hebrides and Zetlands (Barlee); where we have met with it in depths ranging from ten to sixty fathoms on muddy and gravelly bottoms (M'Andrew and E. F.). In Ireland it has been taken in Cork harbour (Humphreys); and Bantry Bay (Barlee). It ranges from Sweden to the Mediterranean, and is a coralline crag fossil.

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* The *P. Forbesii* of Reeve (Conch. Icon. vol. i. Pleur. pl. 37, f. 339) has much the aspect of this species.

M. STRIOLATA, Scacchi.

Turreted-fusiform, with a dark infrasutural fillet, usually lineated with yellowish brown, with dense but minute spiral striulæ, and about nine or ten square-cut straightish longitudinal ribs on the principal turns; mouth not peculiarly contracted; lip only a little thickened; labial sinus slight.

Plate CXIV. A. fig. 1, 2.

Pleurotoma striolata (not *Mangelia striolata*, RISSO, vol. iv. f. 101), SCACCHI, Catal. Conch. Neapolit. (1836), p. 12 teste PHILIPPI, Moll. Sicil. vol. ii. p. 168, pl. 26, f. 7 (from type).—THOMPSON, Ann. Nat. Hist. vol. xviii. p. 384 (no description).—REEVE, Conch. Icon. vol. i. Pleur. pl. 35, f. 320.

" *Smithii*, FORBES, Ann. Nat. Hist. vol. v. (1840), p. 107, pl. 2, f. 14 (badly).—Brit. Marine Conch. p. 198.

" *Farranii*, THOMPSON, Ann. Nat. Hist. vol. xv. p. 316, pl. 19, f. 3.

Murex Smithii, CLARK, Annals Nat. Hist. 2nd ser. vol. vii. p. 127.

The characters of this rare shell are allied to those of *costata* and *coarctata*, but its form is more turreted than in either of them. It is moderately strong, but little shining, and of a whitish or pale ochraceous hue, marked beneath the suture with a livid or chocolate brown revolving fillet, and sometimes likewise, with a second narrow zone, that winds rather below the middle of the body-whorl; numerous tawny spiral lines, that are occasionally, however, almost obsolete, adorn the principal volutions. When quite fresh, the surface is seen under the lens to be most densely encircled with scarcely elevated minute striæ, besides which several (about nine or ten on the larger turns) strongly projecting remote and narrow ribs, that are neither arched towards their base, nor at all flexuous, traverse the whorls lengthways from top to bottom, and reach to the extreme base of the body; their intervals are concave, and broader than the costæ themselves. The whorls are high, and of moderately fast longitudinal increase; they are well defined by a rather slanting simple but very deep suture. The spire, which is composed of eight coils, usually exceeds, and always vies with the length of the body; its apex is finely pointed. The whorls do not taper above, the gradual diminution of breadth in the spire being effected by the narrowing throughout of each successive coil; they assume, too, a slightly subscalar appearance from the circumstance that, although not at all ventricose in the middle, they bend in a little both above and below. The body is rather narrow, and is somewhat quickly attenuated to a moderately acute basal extremity. The narrow mouth, which is nearly as broad below as above, occupies from scarcely two-fifths to three-sevenths at utmost, of the ventral length; its contraction is scarcely so great as in *costata*, since the external rib that thickens the outer lip of that species is broader than in the present shell. The outer lip, after its slightly abrupt projection, and not very conspicuous posterior sinus, is at first nearly straight, and then continuously curves inwards in a moderately convex line. The pillar lip, which, as well as the throat, is devoid of sculpture, is white, and nearly straight. Our largest example is rather more than eight lines long, and about two lines and a half broad.*

We have never seen the animal of this species. Mr.

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* The *P. costulatum* of Philippi (Moll. Sicil. vol. ii. p. 166), and Kiener (Coq. Viv. Pleur. p. 78, pl. 25, f. 2), approaches very closely to our shell, and Middendorff's description of it (Mal. Rossic. pt. ii. p. 117) agrees fairly enough; as, however, the characters ascribed to the original *Mangelia costulata* of Risso (H. N. Europe Mérid., vol. iv. p. 219) do not sufficiently correspond to those of the British species, we have not ventured to cite these references in our synonymy. The *P. costulata* of Cantraine (Bull. Brux. 1839) is not our species

Clark describes it as white, with opaque intense snow-white flakes. The siphon is speckled with pink. The tentacula are short, thick and strong as far as the eyes, short and finely attenuated beyond them. Of all the species he had seen, this had the eyes nearest the points. The foot is truncate and but slightly auriculated in front; lanceolate behind. There is no trace of an operculum.

This is a rare British shell. Dead in ten fathoms at Guernsey, Weymouth and Torbay, but scarce (S. H.); rare at Exmouth, inhabiting the coralline zone (Clark); in twenty fathoms, Frith of Clyde (J. Smith and E. F.); twelve to fifteen fathoms, Bantry Bay, Ireland (M'Andrew); Arran Isles, Galway (Barlee). It is a Mediterranean species.

M. COSTATA, Pennant?

Turreted-fusiform, either broadly banded with rufous or spirally lineated with yellowish brown; with only seven or eight longitudinal ribs on the final turns; no spiral sculpture; whorls not at all scalar; mouth peculiarly contracted by the great thickness of the outer lip; canal short; sinus distinct.

Plate CXIV. A. fig. 3, 4, 5, and (Animal) Plate R. R. fig. 4.

Murex costatus, PENN. Brit. Zool. ed. 4, vol. iv. p. 125, pl. 79, f. 1 of central group?—DONOV. Brit. Shells, vol. iii. pl. 91. — MONT. Test. Brit. vol. i. p. 265. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 144. — TURT. Conch. Diction. p. 92. — DILLW. Recent Shells, vol. ii. p. 743.—CLARK, Ann. Nat. Hist. 2nd Ser. vol. vii. p. 125.

Buccinum costatum, DA COSTA, Brit. Conch. p. 128, pl. 8, f. 4 (copied in Dorset Catal. pl. 14, f. 4).

Fusus costatus, FLEMING, Brit. Animals, p. 349. — Brit. Marine Conch. p. 202. —JOHNSTON, Berwick. Club, vol. i. p. 236.—BROWN, Illust. Conch. G. B. p. 6, pl. 5, f. 45, 46.

Pleurotoma coarctata, FORBES, Ann. Nat. Hist. vol. v. p. 107, pl. 2, f. 15. — Brit. Marine Conch. p. 198.

" *Metcalfei* (not of REEVE'S Iconica), Brit. Marine Conch. p. xlvi.

Mangelia pusilla, Reeve, Conch. Icon. vol. iii. Mang. pl. 7, f. 50.
„ *balteata*, Reeve, Conch. Icon. vol. iii. Mang. pl. 7, f. 57, from type.

It is impossible to precisely ascertain what Pennant meant by his *Murex costatus*, so bald is his description, so imperfect his delineation: the present shell, however, is its traditional representative. Donovan first clearly defined the species, for Da Costa's figure is very uncertain, but we doubt not, from the personal intimacy of the two authors, that their species are identical. We are compelled to annex the *P. coarctata* as a variety, since in a long suite of examples, the peculiar differences merge into each other. As the latter form has been less frequently described, we shall, contrary to our usual habit, give a more detailed account of it, and then indicate the differences in the typical specimens of *costata*.

The shell alluded to is strong, opaque, of little lustre, and of a turreted-fusiform shape; but the form varies, as the spire is sometimes much more elongated than ordinary. Numerous tawny lines, that are sometimes a little interruptedly spiral, sometimes form an irregular net-work, adorn the whitish ground of its exterior, besides which a broader interrupted fillet of brown or fulvous, often winds below the sutural line, and a similarly-coloured blotch, like the commencement of another band, frequently makes its appearance, behind the lip, near the middle of the body. Seven or eight strong and very prominent slightly flexuous rather distant abruptly elevated ribs traverse the shell lengthways; besides which most minute and densely-disposed spiral striæ are disclosed by a magnifying-glass of ordinary power; the intervals of the ribs are concave. Although the eight and a half moderately high and but little rounded whorls that compose the shell are only divided by a fine suture, they are well defined by the greater elevation of the ribs towards the base of each turn. The mouth occupies from three-sevenths to one-half of the entire length, and is so greatly contracted by the external rib of the outer lip, as to be almost equally narrow throughout. The throat is smooth, and though usually marked far inwards with a reddish tawny blotch, yet towards the exterior, at least, is white. The edge of the outer lip is thrown back, as it were, at the arcuated posterior sinus, which is quite distinct, though small, and very profoundly indented; the lip itself, which is thickened by the external ribs, at first projects rather abruptly, and then slopes inward with a gentle and continuous curvature. The pillar lip is white, nearly straight, much elongated, and not very broad. Half an inch for the length, and two lines for the breadth, are the ordinary dimensions of mature examples.

The *costata* proper is usually less turreted and much smaller, averaging scarcely more than a quarter of an inch long, though occasionally it vies (as in the elongated variety, *Metcalfei*) in both respects with the preceding form. The lines of colour become partially or wholly confluent, so that in the more typical specimens the upper part of the body is broadly banded with rufous brown, or chestnut (which zone is almost always continued upon the spire, whose turns frequently are wholly of the darker hue), the lower half of the body being white or nearly so. There are rarely more than seven and a half whorls, of which the two or three apical ones are quite smooth; usually, too, they are shorter than in *coarctata;* the margin of the outer lip is broad, and the sinus very distinct.*

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* The *P. Bertrandi* of PAYRAUDEAU (Moll. Corse, p. 144, pl. 7, f. 12, 13), and the *P. cærulans* of PHILIPPI (Moll. Sicil. vol. ii. p. 168, pl. 26, f. 4), approach very closely indeed to this form; but the ribs on each volution seem more numerous.

The animal of var. *costata* is bluish-white (Mr. Clark describes an example as "azure, shot with brilliant snow-white streams"). The tentacula are of moderate length, set well apart at their origins, thickened to the prominent eye-bulgings, which are at nearly or quite half their lengths, thinner but clavate at their tips. The foot is truncate, with obtuse angles in front, attenuated and lanceolate, but rather obtuse behind. There is no trace of an operculum. The animal of var. *coarctata* is opaque-white and rather more obtuse caudally; in all other respects identical.

In one or other of its forms, this species is generally distributed around the British coasts, and in many localities is very plentiful. It ranges from five, or less, to fifty fathoms, inhabiting stony and sandy grounds. As a general rule, the form *costata* is commonest in the south, *coarctata* in the north. It ranges from Sweden to the Mediterranean. Its ancient history is not as yet very clear.

M. ATTENUATA, Montagu.

Narrow fusiform, spirally lineated with brown, with about nine longitudinal ribs on the principal turns, otherwise smooth, and shining; mouth filling about half the length; canal elongated; labial sinus slight.

Plate CXIII. fig. 8, 9, and (Animal) Plate R. R. fig. 5.

Murex attenuatus, Mont. Test. Brit. p. 266, pl. 9, f. 6. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 143.—Turt. Conch. Diction. p. 91. — Dillw. Recent Shells, vol. ii. p. 742. — Wood, Index Testaceol. pl. 27, f. 128.—Clark, Ann. Nat. Hist. 2nd Series, vol. vii. p. 125.

„ *aciculatus*, Lam. Anim. s. Vert. (ed. Desh.) vol. x. p. 610.

Fusus attenuatus, Fleming, Brit. Anim. p. 350. — Brit. Marine Conch. p. 203, f. 94.—Brown, Illust. Conch. G. B. p. 7, pl. 5, f. 37, 38.

Pleurotoma Villiersi, Michaud, Bullet. Linn. Soc. Bordeaux, vol. iii. (1829), p. 262, f. 4, 5 (teste Phil.). — Kiener, Coq. Vivant. Pleurot. p. 80, pl. 27, f. 1.

Pleurotoma gracilis, SCACCHI, Catal. Test. Neapol. p. 13, f. 21.
„ *gracile*, PHILIPPI, Moll. Sicil. vol. i. p. 198, pl. 11, f. 23.
„ *attenuatum*, PHILIPPI, Moll. Sicil. vol. ii. p. 166.
„ *attenuata*, REEVE, Conch. Icon. vol. i. Pleurot. pl. 28, f. 248.

This beautiful shell has a blunt subfusiform shape, and tapers much and gradually to either extremity; it is rather thin (for its genus), shining, not quite opaque, and adorned, on a ground of pale ochre colour, with numerous rather distant revolving lines of chestnut brown. In addition to these markings—which are frequently absent in the young —a single brown or liver-coloured narrow fillet may usually be observed in the finer specimens; it runs just below the extremely fine and oblique suture, but is more conspicuous when continued thence across the middle of the body-whorl, where it is often preceded by a rather broader obscurely defined whitish or pallid band. There is no spiral sculpture, but several (about nine on the final volutions) strong distant more or less curved prominent ribs traverse each of the principal whorls lengthways (for the two or three apical ones are smooth), and extend to the extreme base of the body: they become much thinner below the suture. Of the eight or nine coils which compose the shell, the body (or last formed) is about equal to the rest united, and is somewhat planulate upon its lower half. The whorls are rather high, of moderately quick increase, and are decidedly convex (at least the elevated portion); the apex is finely pointed. The mouth, which is devoid of sculpture, occupies about one-half of the entire length; it is very narrow, and is contracted below to a moderately long and straight canal. The rather projecting outer lip, whose posterior sinus is very slight, is thickened in the adult by the external rib. The inner lip is nearly straight, and is often stained anteriorly with chestnut or liver-colour. Examples do not usually measure more than half an inch in length, and two lines in breadth.

The animal is white, with flaky specks. Its tentacula are closely set at their bases, very long for the genus, subulate, with the eyes on bulgings very low down and not far from their origin. The foot is lanceolate, truncated, and acutely angulated with auricles in front. The siphon is rather more attenuated than usual. Mr. Clark's notice of this animal differs from our notes; he resembles it to that of *gracilis*. He states that the male organ is of a pea-green colour.

This is, in the main, a southern species, and rather scarce. Dredged alive, and in peculiarly fine condition, at Torbay, in from seven to ten fathoms; also abundant at Tenby, dead (S. H.); Exmouth, rare (Clark); Torquay (Battersby); Bristol Channel (Jeffreys); Guernsey (E. F.). In eighteen fathoms, mud, Hebrides (M'Andrew and E. F.); Oban (Barlee). On each side of Ireland, but extremely sparingly (W. Thompson); Bantry (Jeffreys); Cork Harbour (Humphreys).

It ranges to the Mediterranean.

The following small *Fusi* in Brown's "Illustrations," apparently belong to this genus, but have baffled alike our own attempts at identification, and those of our scientific correspondents.

F. multilinearis (p. 6, pl. 5, f. 22, 23) approaches *attenuata*, *Smithii*, and *costata*, but has its outer lip dentated within as in *purpurea*.

F. crassus (p. 7, pl. 5, f. 8, 9) is possibly a *nebula*, judging from the assigned number of its ribs, not from the figure, which might pass for a worn *attenuata* with its beak broken off, or else for *costata*.

F. fasciatus (p. 6, pl. 5, f. 41, 42) reminds one a little of *striolata*, but is stated to have fifteen ribs.

F. minutus (p. 8, pl. 5, f. 18, 24) is clearly the fry of a larger shell.

F. punctatus (p. 7, pl. 5, f. 56, 57), possibly a young worn *purpurea*.

SPURIOUS.

M. ACCINCTA, Montagu.

Murex accinctus (not of BORN), MONT. Test. Brit. Suppl. p. 114. — LASKEY, Mem. Werner. Soc. vol. i. pl. 8, f. 14.—TURT. Conch. Diction. p. 91.
Fusus „ FLEMING, Brit. Anim. p. 350.—Brit. Marine Conch. p. 205.—BROWN, Illust. Conch. G. B. p. 7, pl. 5, f. 14, 15.
Pleurotoma Forthiensis, REEVE, Conch. Icon. Pleurot. pl. 28, f. 246.

Small, turreted-subfusiform, not very solid, white or yellowish white, with a rather indistinct narrow spiral fillet of brownish yellow, that runs a little above the middle of the body-whorl, and winds, attenuating as it proceeds, along the base of the smaller volutions. A somewhat obsolete similar one, that revolves beneath the suture of the principal turns, for the most part (yet not always) accompanies it. Both these coloured zones, when magnified, are perceived to be composed of from two to five parallel painted lines. The entire external surface (the apical turns excepted) is roughened with numerous fine raised spiral lines (some of which are at times elevated more than the rest, so as to present an irregular and very slight clathration with the longitudinal costæ, which traverse the whorls from top to bottom. These last, whose intervals, at least, on the principal whorls, are decidedly broader than the ribs themselves, are sharpish, narrow, prominent, and not straight, but sinuous, being reflected above parallel to the sinus of the outer lip.'

In addition to this sculpture, a powerful lens will usually reveal still more minute and densely disposed oblique longitudinal lines in the meshes of the decussation. There seem, in the more perfect examples, to be nine volutions, but seven alone are generally visible, as the two extremely small top ones (the apex is very finely pointed) are usually worn away; they are of moderate longitudinal increase, and are very well defined, though the suture is fine and simple, from the contrast between the slight retusion that succeeds the latter, and the convexity of the lower portion of each volution; the penult turn is rather high. The narrow aperture scarcely occupies two-fifths of the entire length, often, indeed, scarcely more than a third; it is of an uniform white, devoid of all sculpture, and of an elongated oblong figure, that is acutely contracted above, and gradually terminates below in a short canal. The posterior sinus of the outer lip, which is acute, simple, but little projecting, moderately arched, and more disposed to coil inward than to expand, is rounded and rather large. There is a slight incurvation at the superior portion of the columellar lip, which below is almost straight or slightly convex. The length is nearly five lines and a half; the breadth about the eighth of an inch: it inhabits the West Indies.

PLEUROTOMA SINUOSA, Montagu.

Murex sinuosus, MONT. Test. Brit. vol. i. p. 264. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 145. — DILLW. Recent Shells, vol. ii. p. 744.—WOOD, Index Testaceolog. pl. 27, f. 135.
Pleurotoma sinuosa (not FLEMING nor COUCH), Brit. Marine Conch. p. 195.— BROWN, Illust. Conch. G. B. p. 8, pl. 5, f. 40. — REEVE, Conch. Icon. vol. i. pl. 34, f. 307.

An exotic shell, we believe from Africa; said to have been taken by Mr. Bryer at Weymouth.

M. MULTILINEOLATA, Deshayes.

Pleurotoma multilineolata, DESH. Exped. Sci. Morée, Zool. p. 178, pl. 19, f. 46. —PHILIPPI, Moll. Sicil. vol. ii. p. 166, pl. 26, f. 1.
Fusus lineatus, BROWN, Illust. Conch. G. B. p. 6, pl. 5, f. 1, 2, from types.

A native of the Mediterranean Sea; introduced as Irish in Brown's "Illustrations."

CYPRÆADÆ.

Of this group, remarkable for the exquisite beauty of its shells, we have but few, and those comparatively insignificant representatives, in our fauna. The majority of species in the tribe are inhabitants of the tropics, where their brilliant colours and polished surfaces accord better with light and warmth. The shells of all the genera are involute, and usually have but small spires. Their apertures are canaliculated for the passage of a well-developed siphonal process. Their surfaces are often highly polished and porcellanous, exhibiting no traces of an epidermis. The animal has large lateral lobes, often brightly coloured and variously ornamented, which it reflects upon the shell. Its head is intermediate in form and parts between those of the groups of gasteropoda, with a retractile proboscis, and with a muzzle. The dentition approximates the *Cypræadæ* to the latter section. There is but one branchial plume. The individuals are bisexual. There is no operculum.

The difference of aspect between these mollusks when crawling, with all their beautifully coloured soft parts exposed, often completely concealing their enamelled shells, and their appearance when, after being seized, they suddenly and instantaneously withdraw their bodies and mantle-lobes and expose the shell only, is very curious and surprising.

CYPRÆA. Linnæus.

Shell ovate, ventricose, more or less subglobose, surface polished, smooth or sulcated, whorls convolute, spire enveloped by the body-whorl and only very slightly visible, aperture elongated, narrow, canaliculated at each end, outer lip inflected, both lips in most species crenulated. No epidermis.

Animal with very large smooth or tuberculated mantle-lobes, capable of entirely or almost entirely investing the shell, on which a line or groove marks the approximation of their edges. Head broad, sublunate; proboscis retractile; tentacula long, subulate, the eyes on bulgings at their external bases. Rows of lingual teeth composed of one quadrate uncinated axile tooth flanked on each side by three uncinated hamate laterals; jaws corneous; lingual ribband rather long. Male organs very large, compressed, reflected. Branchial plume single.

In the young state the shell of these cowries are very dissimilar from adults, and since the size of individuals of the same species is very variable, so that a young specimen may often be found as large as a full grown one, mistakes have been made, and much controversy wasted about supposed specific, and even generic, differences between young and old examples. This extensive and most beautiful genus is so poorly represented in our seas by but a single species, that a discussion of the many points of interest presented by the features and variations of the animals it includes, and the peculiarities of the structure of the shell, would be out of place in this work.

C. Europæa, Montagu.

Plate CXIV. a. fig. 6, 7, 8, 9, and (Animal) Plate N. N. fig. 5—7.

List. Anim. Angl. pl. 3, f. 17; Hist. Conch. pl. 707, f. 57.

Cypræa pediculus, vars. Europæa and *Anglica*, Linn. Syst. Nat. ed. 12, p. 1180.

Porcellana, &c. Mart. Conch. Cab. vol. i. p. 379, pl. 29, f. 309.

Cypræa pediculus, Penn. Brit. Zool. ed. 4, vol. iv. p. 115, pl. 70, f. 82. — Da Costa, Brit. Conch. p. 33, pl. 2, f. 6. — Donov. Brit. Shells, vol. ii. pl. 43.—Mont. Test. Brit. vol. i. p. 200.— Maton and Rack. Trans. Linn. Soc. vol. viii. p. 120.— Rack. Dorset Catal. p. 42, pl. 22, f. 6. — Turt. Conch. Diction. p. 35.—Wood, Index Testac. pl. 17, f. 60.

„ *arctica*, Pulteney (as of Solander MSS.), Hutchins, Hist. Dorset, App. p. 39 (1799). — Mont. Test. Brit. p. 201. — Rack. Dorset Catal. p. 42.—Harvey, Proc. Zool. Soc. 1834, p. 28.

„ *Europæa*, Mont. Test. Brit. Suppl. p. 88. — Laskey, Mem. Werner. Soc. vol. i. p. 395. — Fleming, Brit. Animals, p. 330. — Forbes, Malac. Monens. p. 27, animal. — Johnston, Berwick. Club, vol. i. p. 240, with animal. — Couch, Cornish Fauna, pt. 2, p. 66. — Macg. Moll. Aberd. p. 175. — Brit. Marine Conch. p. 223.—Brown, Illust. Conch. G. B. p. 3, pl. 2, f. 6, 8, 10, 12.—Dillw. Recent Shells, vol. i. p. 647. —Gray, Zool. Journ. vol. iii. p. 366.—Reeve, Conch. Icon. vol. iii. Cypræa, pl. 23, f. 129.

„ *bullata* (young), Mont. Test. Brit. vol. i. p. 202, pl. 6, f. 1. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 121.—Harvey, Proc. Zool. Soc. 1834, p. 28.

Bulla diaphana (young), Mont. Test. Brit. vol. i. p. 225, pl. 7, f. 8. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 126. — Turt. Conch. Diction. p. 22.

Cypræa coccinella, Lam. Anim. s. Vert. (ed. Desh.) vol. x. p. 544. — Blainv. Faune Franç. Moll. p. 247, pl. 9, a. f. 1.—Desh. Encycl. Méth. Vers, vol. iii. p. 830.—Philippi, Moll. Sicil. vol. i. p. 236 (chiefly); vol. ii. p. 199.

„ *umbilicalis*, Costa, Test. Sicil. p. 71.

„ *Norvegica*, Sars, Beskriv. Bergenske Kyst, p. 71, pl. 12, f. 35.

Bulla candida, Macgilliv. Moll. Aberd. p. 189, copied Brit. Marine Conch. p. 252 (fry, teste Jeffreys from type).

Dr. Pulteney was the first to publish this shell as a species distinct from *pediculus*, so that perhaps, strictly speaking, the name *arctica* ought to be applied to it; his description, however, is insufficient, in the vernacular, and applicable rather to the variety ("without spots") than to the species.*

The shell, when adult, is simply ovate, not peaked at either extremity, ventricose, shining, tolerably strong, and of a pale livid flesh-colour, that changes into pure white on the margin and at the base. The back, which is never traversed by any longitudinal furrow (as in most of the allied species), is oftentimes marked with three rather large dusky spots, one near each extremity, and one in, or rather above the middle; of these the posterior is rather the broadest, and the anterior decidedly the smallest; the latter, as well as the one above it, lie behind the ordinary site of the dorsal sulcus. Frequently, too, and especially in Northern individuals, these spots are altogether absent, in which case the sculpture is apt to be coarser, and the threads fewer, than usual. Numerous simple (not beaded) and somewhat rounded filiform ridges cross the shell throughout, and are separated by smooth intervals of about their own width. The margin is not very deep: the base is convex. The mouth is linear, and a little curved, especially posteriorly. The outer lip is broad and thickened. The teeth, which are rather small and numerous, are equal in size upon both lips. A fine specimen measured half an inch long, and a third of an inch in breadth.

In the half grown form (*bullata*), the threads are scarcely if at all raised, the shell being nearly smooth and transparent, and the teeth rudimentary; the spire is partially revealed.

The fry, which was supposed by some of the earlier writers to be an adult *Bulla*, is very different from the mature shell, and reminds one somewhat of a *Succinea* in its general aspect. It is snow-white, extremely fragile, more or less pellucid, has a short blunt spire of two or three rounded turns and a capacious suboval aperture that is very acutely contracted above, and is broad and peculiarly open anteriorly. The outer lip is sharp and simple, and as well as the inner one, is destitute of teeth.

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* The *C. pediculus* of his Dorset list is a West Indian shell, and is the species so named by modern writers (Gray, Zool. Journ. vol. iii. p. 370, not var.; Reeve, Conch. Icon. vol. iii. Cypr. pl. 23, f. 131). The sulcated variety of *pediculus* stated by Dr. Turton (Zool. Journ. vol. ii. p. 566) to have been taken alive at Weymouth, is probably the same species.

The animal is extremely variable in its colouring. The mantle-lobes (which are only fully developed in the adult) are sometimes bright orange, or yellow edged with orange, and marked with broad transverse dusky bands, sometimes mottled with brown, deep green and orange, without bands, and occasionally of an uniform pinkish yellow hue, with orange edges; their surface is in some examples nearly smooth, in others papillated. The head bears very long tentacula; the siphon is often much produced; the foot is very large, truncated in front, posteriorly extending far beyond the shell, and terminating in a rather obtuse end. The foot, head, and siphon are most commonly of a pale orange colour.

This pretty shell is diffused everywhere around the British shores, and ranges from the verge of low water to as deep as fifty fathoms. The number of old shells taken surprisingly exceeds that of the young. It dates its place in our area from the epoch of the coralline crag, and at present ranges through the seas of Europe.

OVULA. Brugiere.

Shell egg-shaped, or sometimes spindle-shaped, its surface polished, smooth, grooved or striated, whorls convolute, spire enveloped by the body-whorl, aperture elongated, channelled at both ends, narrow, with the outer lip reflected, smooth or denticulated, the inner lip constantly smooth. No operculum.

The animal, when crawling, extends its mantle-lobes over a great part of both sides of the shell. They are smooth or tuberculated. Head rather broad, muzzle-shaped, tentacula long, eyes on bulgings at their external bases. Male organ large, compressed, curved, reflected. Branchial plume single. Jaws strong, corneous; lingual ribband short.

The distinctions between *Ovula* and *Cypræa* are very slight, although there is no difficulty in drawing a line between the species of the two genera. The kinds of *Ovula* have been grouped under several subgenera; our British species belong to the section to which the names *Volva* and *Radius* have been applied. It has been proposed of late to revive the pre-linnæan name *Amphiperas* for the *Ovulæ*. Such a change would only lead to inconvenience without corresponding benefit.

O. PATULA, Pennant.

Not minute, oblong-subfusiform; mouth open, peaked at both ends; pillar perpendicular below.

Plate CXIV. B. fig. 1, 2, and (Animal) Plate N. N. fig. 1—4.

Bulla patula, PENNANT, Brit. Zool. ed. 4, vol. iv. p. 117, pl. 70, f. 85, A.—PULTENEY, Hutchins, Hist. Dorset, p. 40.—MONT. Test. Brit. vol. i. p. 207; Suppl. p. 93. — DONOV. Brit. Shells. vol. iv. pl. 142 (on text, 143); in Rees' Cyclop. pl. Elem. Conch. 2, f. 13.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 121. — RACK. Dorset Catalog. p. 43, pl. 12, f. 8. — TURT. Conch. Diction. p. 21, f. 27, 28.—DILLW. Recent Shells, vol. i. p. 475. —WOOD, Index Testac. pl. 18, f. 8. — GRATEL. Sur les Bull. (and in Bull. Linn. Bordeaux), p. 28.

Volva „ FLEMING, Brit. Anim. p. 331.

Ovulum patulum, Sowerby, Zool. Journ. vol. iv. p. 161; Species Conch. p. 10, f. 58. — Bullet. Sc. Natur. 1829, vol. xviii. p. 127. — Sowerby (Jun.), Thesaur. Conch. vol. ii. p. 478, pl. 101, f. 105, 113.

Ovula patula, Kiener, Coq. Viv. Ovula, pl. 3, f. 4.—Brit. Marine Conch. p. 222. —Brown, Illust. Conch. G. B. p. 3, pl. 2, f. 11, 13.—Desh. Lam. Anim. s. Vert, (ed. Desh.) vol. x. p. 477.

This elegantly formed shell cannot well be mistaken for any other native species. It is involute, rather thin, of an uniform white or very pale pink, more or less shining, and smooth or nearly so, but has a few spiral striæ at each extremity. Its shape is oblong-subfusiform, being a little beaked above, and tapering gradually below to a blunt-tipped acute angle. The back is not all angulated, but rounded, and the declination from the centre of it to either end is decidedly convex. The canal ridge is strongly marked, and there is a slight longitudinal indentation between it and the pillar, which last is rather elongated. The mouth extends the whole length of the shell, is very open in the middle, but contracts (and more especially above) to a canal at both ends; the throat is quite smooth. The outer lip is simple, acute, and arcuated. The pillar is a little twisted at both ends, and much shorter posteriorly. The length of a very fine example was nearly an inch, and its breadth about half that measurement.

The animal is pale, nearly white, except the mantle, which is slightly tinged with yellow, and barred with fine, simple vertical orange stripes. The head is proboscidiform with two filiform tentacula, thickened towards their bases to form prominent external bulgings on which are placed the very black conspicuous eyes. The mantle is reflexed on the shell so as to occupy about one-third of each side; it is not fimbriated or tuberculated. The siphon is rather long, white, and entire. The foot is very long, rather broad, though scarcely broader than the shell; its frontal angles are rounded. Posteriorly it exceeds the length of the shell by a third of the length of the animal; it is flattened above caudally, and shows a whitish central line and radiating lateral streaks: the extremity is obtuse. This creature is active and not shy; when at rest it puckers its mantle.

It is essentially a southern and western species. We have dredged it alive in the crevices of *Alcyonium* off the Land's End in twenty fathoms water (E. F. and R. M'Andrew); Exmouth (Clark); Plymouth (Barlee); Birterbuy Bay, and Arran in Ireland (Barlee); "Magilligan in Londonderry [Mrs. R. A. Hyndman]" (Thompson).

It ranges to the Mediterranean.

O? ACUMINATA, Bruguiere.

Minute, extremely narrow; mouth contracted above, broadly and very bluntly rounded below; pillar curving to the left.

Plate CXIV. B. fig. 3.

PLANCUS, Conch. Minus Notis, p. 2, art. 1, the unfigured var. —SOLDANI, Testaceog. pl. 10, f. 62, II. fossil.

Bulla acuminata, BRUG. (not Sow. Min. Conch.). Encycl. Méth. Vers, vol. i. p. 376. — JEFFREYS, Ann. Nat. vol. xix. p. 310. — BOSC, Hist. Nat. Coquilles, vol. iv. p. 68. — PHILIPPI, Moll. Sicil. vol. i. p. 122, pl. 7, f. 18, and vol. ii. p. 96.—GRATELOUP, Sur les Bulléens, pp. 27, 63, f. 43, 44 (from Bull. Linn. Bordeaux, vol. ix.).—S. WOOD, Crag Moll. p. 174, pl. 21, f. 7.

Cylichna „ LOVÉN, Index Moll. Scand. p. 10 (no description).

Bulla (Volvula) acuminata, A. ADAMS, Sow. Thesaur. Conch. vol. ii. p. 596, pl. 125, f. 152.

This minute shell has a narrow oblong-fusiform shape, being attenuated at both extremities, though very unequally so, since it is most sharply acuminated above, but only bluntly taper below. It is of uniform and shining pure white, both within and without, is rather thin, and smooth or nearly so, exhibiting at most (and that not always) a few remote and usually obscure transverse striæ at the extremities. The back is neither gibbous nor angulated, but is only moderately rounded ; the slopes from the middle are gradual, but convex. The aperture, which occupies the entire length, is curved and narrow ; above it is so contracted as to be almost linear ; below it dilates, and is broadly and very bluntly rounded at the slightly recurved anterior extremity. The throat is quite smooth. The outer lip is simple, acute, more or less arcuated, not contracted in the middle, but more perpendicular and less curved below than above. The pillar lip, which is elevated, twisted, and somewhat reflected, so as to appear pliciform, curves to the left ; it is not particularly elongated, yet is longer than the straight narrow and remarkably acute point in which the body terminates posteriorly. The length, which is at most the sixth of an inch, is nearly thrice the extreme breadth.

This is one of our rarest shells. We have not as yet met with it alive. An observation of the animal would be of great consequence, since its true generic position is as yet undetermined. It has been dredged in Lamlash Bay (Alder) ; Loch Fyne, off Stornoway, and at Lerwick, in Scotland ; also on the Galway coast (Barlee) ; off the south coast of Ireland (M'Andrew).

It ranges to the Mediterranean. During the coralline crag epoch it appears to have been abundant within our area.

MARGINELLA. Lamarck.

Shell ovate or oblong, smooth and polished, spire short but visible, body-whorl large, more or less ventricose or sub-cylindrical; aperture narrow, canaliculated below; outer lip more or less inflected, often thickened and denticulated. No operculum.

Animal with large, usually papillose mantle-lobes, reflected on the shell and over the spire; head somewhat muzzle-shaped, mouth with a retractile proboscis; tongue constructed like that of *Cypræa*, tentacles subulate, bearing eyes on bulgings at their external bases; siphon produced; foot large, truncate in front, obtuse behind.

The only British species of this elegant genus belongs to that section of it in which the shells have a thickened outer lip. These constitute the genus *Erato* of Risso, but cannot be regarded as more than a section of *Marginella.*

M. lœvis, Donovan.

Plate CXIV. b. fig. 4, 5, and (Animal) Plate N. N. fig. 8, 9.

Bulla voluta, Mont. Test. Brit. p. 203, pl. 6, f. 7; Suppl. p. 91.

Voluta lævis, Donov. Brit. Shells, vol. v. pl. 165. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 133. — Turt. Conch. Diction. p. 252.— Dillw. Recent Shells, vol. i. p. 527.—Wood, Index Testaceolog. pl. 19, f. 61.

,, *fusiformis*, Turt. Conch. Diction. p. 251, copied as *Acteon fusiformis*, Fleming, Brit. Anim. p. 337; as *Auricula* and *Tornatella fusiformis*, Brit. Marine Conch. p. 145, p. xxxiv. (young from type).

Erato Cypræola, Risso, Hist. Nat. Europe Mérid. vol. iv. p. 240, f. 85 (fossil).

Marginella Donovani, Payraud. Cat. Moll. Corse, p. 167, pl. 8, f. 26, 27.—Brit. Marine Conch. p. 220. — Kiener, Coq. Vivant. Marg. p. 16, pl. 8, f. 34.

,, *voluta*, Fleming, Brit. Anim. p. 335.

Volvaria Donovani, Blainv. Faune Franç. Moll. p. 228, pl. 8, B. f. 3.

Marginella muscaria (not of Lamarck), Costa, Cat. Test. Sicil. p. 73.

Erato lævis, GRAY, Sowerby's Conch. Illust. Catalog. Cyp. p. 15, f. 57.—REEVE, Conch. System. vol. ii. pl. 285, f. 3.
„ *Cypræola*, PHILIPPI, Moll. Sicil. vol. i. p. 233.
Columbella lævis, BROWN, Illust. Conch. G. B. p. 4, pl. 8, f. 15.
Marginella „ PHILIPPI, Moll. Sicil. vol. ii. p. 197.— DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. x. p. 452.

This pretty little shell approaches in many of its characters to the *Erato Maugeriæ* of Gray (a common West Indian species), but differs in its colouring, its longer spire, and in its less broad and stunted form. Its shape is reversed oval-conoid, being broad near the top, and gradually attenuated below to a rounded yet moderately narrow peak; the length is decidedly more than half as much again as the extreme breadth. It is tolerably strong, yet a little translucent, perfectly smooth, being devoid of all sculpture, and of an uniform highly polished ivory-white (occasionally tinged slightly with green or yellow), except at the commencement of the outer lip and at the tip of the beak, which are generally (the latter almost invariably) stained with purplish rose colour. A very blunt apex terminates the spire, which, although short (as is customary in the genus), is longer than in *Maugeriæ*, and usually fills more than a fifth of the dorsal length. It is composed of about three, or three and a half, moderately convex ill-defined whorls, whose longitudinal increase is fast, but not quite regular. The body is subangulatedly tumid, the swell not being in the middle but nearer the suture: the basal declination is moderately quick, and a little convex: the short beak is slightly recurved. The mouth, which terminates below in a rather open canal, is linear, and occupies the greater portion of the ventral length: the spire, however, is very manifestly raised above the level of the outer lip. This last is broadly marginated (hence the contraction of the aperture in the adult shell), and runs, with but slight convexity, almost parallel to the course of the opposite lip; it is obsoletely and closely denticulated at its inner edge. Numerous small pliciform granules, the two lower of which are more distinctly perceptible, may be traced on the lower portion of the pillar lip. Fair-sized examples measure three-eighths of an inch in length, and two-ninths of an inch in breadth.

The animal when creeping has the mantle, which is tuberculated and scabrous, reflected over the spire and sides of the shell, leaving only the central and upper part of the body-whorl exposed and conspicuous for its whiteness, since the mantle-lobes are speckled and mottled with black, brown, and yellow; the tubercles are pale or nearly white. The siphon is long, and speckled with orange and yellow. The head is rather broad, not produced in front, and flanked by two long slender tentacula, with slightly clavate tips; the eyes are large and placed on prominences at their external bases. The foot is lanceolate, truncate, and auriculated in front, pointed behind: its sole is speckled with orange, as are more or less its sides and the head, which otherwise are of a pale flesh-colour. The frontal margin of the foot has a narrow mantle fold.

This shell, though commonly regarded as rather a scarce one, is universally diffused, though very sparingly, through the British seas, and inhabits all our shores. It ranges from one to fifty fathoms.

It ranges to the Mediterranean, and was an inhabitant of the British area during the coralline and red crag epochs.

SPURIOUS.

M. PALLIDA.

Bulla cylindracea, DA COSTA (not PENNANT), Brit. Conch. pl. 2, f. 7.
„ *pallida* (not LINN. Mus. Ulric.), DONOV. Brit. Shells, vol. ii. pl. 66; Rees, Encycl. Conch. pl. 1.
Voluta „ MONT. Test. Brit. p. 232.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 132.—TURT. Conch. Diction. p. 251.—DILLW. Recent Shells, vol. i. p. 527.
Volvaria „ LAM. Anim. s. Vert. (ed. Desh.) vol. x. p. 460.—FLEMING, Brit. Anim. p. 333.—Brit. Marine Conch. p. 221.—CROUCH, Introd. Lam. Conch. pl. 19, f. 15.—CUVIER, Anim. Kingd. (ed. Griffith) pl. 6, f. 14.
Marginella „ KIENER, Coq. Vivant. Marg. pl. 13, f. 2.—SOWERBY, Thesaur. Conch. vol. i. p. 390, pl. 76, f. 108.

A West Indian shell (Sowerby); introduced by Da Costa (who confused it with the B. cylindracea) *as from our western shores.*

M. CATENATA, Montagu.

Voluta catenata, MONT. Test. Brit. vol. i. p. 236, pl. 6, f. 2; Suppl. p. 104.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 133.—TURT. Conch. Diction. p. 252.—FLEMING, Brit. Animals, p. 332.—COUCH, Cornish Fauna, pt. 2, p. 65.—DILLW. Recent Shells, vol. i. p. 527.—WOOD, Index Testac. pl. 19, f. 60.
Volvaria „ BLAINV. Faune Franç. Moll. p. 231.
Marginella „ Brit. Marine Conch. p. 221.—BROWN, Illust. Conch. G. B. p. 4, pl. 8, f. 14 (badly).—KIENER, Coq. Vivant. Marg. p. 25, pl. 9, f. 41 (badly).—SOWERBY, Thesaur. Conch. vol. i. p. 393, pl. 78, f. 225, 226.

A West Indian shell which Montagu had seen marked in a collection as Cornish.

GASTEROPODA OPISTHOBRANCHIATA.

A large section of marine gasteropodous Mollusca is unprovided with shells except in the larva state. The majority of this group are hermaphrodite. When a shell is present it is convoluted or reduced to a simple corneous or calcareous branchial lid. The branchiæ are not lodged in a supra-cervical cavity, and the heart, in the great majority of instances, is placed in advance of the gills. The auricle of the heart is usually behind the ventricle.

The orders *Tectibranchia* and *Nudibranchia* of Cuvier form two very natural sections of this division of Gasteropods.

BULLIDÆ.

This tribe may be considered intermediate between the two great sections of Gasteropoda. The shells of its mollusks are always convolute, and more or less enveloped by the animal, sometimes entirely invested, more rarely absent. Except in the case of *Tornatella* there is no operculum. The head of the animal is in the form of a simple or lobed disk, and its lateral lobes are often greatly developed, so as in many species to serve as swimming organs. The foot is in some extremely small, in others a crawling disk of considerable dimensions.

There are more than one hundred and fifty species of this family known. They inhabit all parts of the world, and some of them are very widely diffused. The shelled forms have lately been monographed, and a classification of the animals and shells proposed by Mr. Arthur Adams, in the "Thesaurus Conchyliorum" of Mr. G. B. Sowerby, jun.

CYLICHNA. Lovén.

Shell cylindrical, usually strong, smooth, striated, or grooved, truncated or subtruncated at the spire, which is in some species involute, in others slightly produced: aperture contracted, slightly dilated below, pillar lip thickened, with or without a fold. No operculum.

Animal not investing the shell; its head depressed, subquadrate, truncate in front, produced posteriorly into two more or less separated broad tentacula in front of whose bases are the more or less distinct eyes; lateral lobes reflected more or less distinctly on the shell; mantle with a posteal process or lobe; foot oblong, shorter than the shell; tongue with a single row of subquadrate axile teeth, with inflexed serrulated apices; these are flanked on each side by several uncinated laterals, the innermost ones much larger than the others. No gizzard.

C. CYLINDRACEA, Pennant.

Moderately large, cylindrical, more or less truncated at both ends; crown not truly umbilicated, only indented; aperture peculiarly bluntly rounded below; fold distinct.

Plate CXIV. B. fig. 6, and (Animal) Plate V. V. fig. 3.

LISTER, Hist. Conch. pl. 714, f. 70.

Bulla cylindracea, PENN. Brit. Zool. ed. 4, vol. iv. p. 117, pl. 70, f. 85.—MONT. Test. Brit. vol. i. p. 221, pl. 7, f. 2; vol. ii. p. 584.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 127.—RACK. Dorset Catalog. p. 43, pl. 18, f. 22.—TURT. Conch. Diction. p. 22.—FLEMING, Brit. Animals, p. 293.—JOHNSTON, Berwick. Club, vol. ii. p. 30, with animal. — Brit. Marine Conch. p. 142.—ALDER, Cat. Moll. Northumb. and Durh. p. 27, animal.—DILLW. Recent Shells, vol. i. p. 496. —WOOD, Index Testaceolog. pl. 18, f. 57. — DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. vii. p. 675.—HANL. Conch. Book Spec. p. 18. — SEARLES WOOD, Crag Moll. p. 175, pl. 21, f. 1.

„ *Oliva*, GMELIN, Syst. Nat. p. 3433, badly (from figures).

„ *cylindrica*, PULTENEY, Hutchins, Hist. Dorset, App. p. 40.—DONOV. Brit. Shells, vol. iv. pl. 120, f. 2.

„ *umbilicata* (not of MONT.), JOHNSTON, Berwick. Club. vol. ii. p. 30, young.

Bullina cylindracea, MACGILLIV. Moll. Aberd. p. 191.

Volvaria cylindrica, BROWN, Illust. Conch. G. B. p. 3, pl. 19, f. 36, 37.

Bulla (*Cylichna*) *cylindracea*, A. ADAMS, Sow. Thesaur. Conch. vol. ii. p. 590, pl. 125, f. 132.

The shell we are about to describe is by far the largest native species of this group. It has a narrow elongated cylindrical shape, being three times as long as it is broad, and almost equal in diameter throughout, being scarcely in the least contracted above or perceptibly dilated below: there is no retusion either in the middle, and both extremities are more or less subtruncated. It is tolerably strong, more or less glossy, and excepting in a rare variety (cab. Hanley) which is decorated with a few spiral lines of brown on the upper half, is utterly devoid of colour. The surface is smooth, or nearly so, but beneath a lens of high power seems covered with most minute and peculiarly densely disposed wavy spiral striulæ. The crown is neither surmounted by a spire, nor is it (even in the fry) truly umbilicated, but seems shallowly indented, and filled up, as it were, with a callus. The mouth is so narrow for the greater portion of its length as almost to be linear, but becomes dilated below by the oblique recession of its pillar; above it is deeply sinuated, and becomes more or less patulous at its anterior extremity, where it is very bluntly and broadly rounded. The acute outer lip runs from above in a nearly straight (not being retuse in the middle) and gradually advancing course, until, after curling inward at the lower medial portion, it suddenly recedes with an abrupt arcuation. The columella is broadly reflected, and bends to the left with a somewhat pliciform twist. Full-sized examples, measure from half an inch to five-eighths of an inch in length, and from two to three lines in breadth.*

The animal is of a linear shape and entire, of a gamboge yellow colour. Its capital disk is very long, somewhat truncate in front, reflected on the shell posteriorly; this reflected and slightly bilobed portion we regard as composed of the united tentacles; some way in front of their bases are two very minute and obscure eyes. The lateral lobes are linear and slightly reflected. The foot is not at all produced beyond the shell, all of which is exposed.

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* Mr. Jeffreys informs us that the specimen described as *Bullina producta* by Macgillivray (Moll. Aberd. p. 335, copied in Brit. Marine Conch. p. 253), was only the young of this species. The *Bulla producta* of Brown (Illust. Conch. G. B. p. 57, pl. 19, f. 15, 16) looks like a young individual of this species with the lip broken; and an Irish shell, supposed to be identical with it (Thompson, Ann. Nat. Hist. vol. xv. p. 314), is assuredly only a *cylindracea* in that condition.

This is a common shell all round the British islands; we have taken it at various depths from one to ninety fathoms, and it is not unfrequently cast on shore. It ranges from the North sea to the Mediterranean, and dates its presence within our area from the epoch of the coralline crag.

C. truncata (Adams?), Montagu.

Longitudinally sulcated above; crown truncated, volutions visible.

Plate CXIV. B. fig. 7, 8, and (Animal) Plate V. V. fig. 4.

Bulla truncatula, Brug. Encycl. Méth. Vers, vol. i. p. 377 ? worn. — Gratel. Sur les Bull. p. 26.
„ *truncata*, Adams, Trans. Linn. Soc. vol. v. p. 1, pl. 1, f. 1, 2, probably.— Mont. (not Gmelin), Test. Brit. vol. i. p. 223, pl. 7, f. 5.— Fleming, Brit. Animals, p. 293.—Brit. Marine Conch. p. 141. — Johnston, Berwick. Club, vol. ii. p. 31. — Alder, Cat. Moll. Northumb. and Durh. p. 28, animal. — Philippi, Moll. Sicil. vol. ii. p. 96. — Searles Wood, Crag Moll. p. 176, pl. 21, f. 3.
„ *retusa*, Maton and Rack. Trans. Linn. Soc. vol. viii. p. 128. — Turt. Conch. Diction. p. 23.—Dillw. Recent Shells, vol. i. p. 497.— Wood, Index Testac. pl. 18, f. 59.
„ *cylindrica*, Scacchi, Notiz. p. 36, pl. 1, f. 14 (teste Philippi).
„ *semisulcata*, Philippi, Moll. Sicil. vol. i. p. 123, pl. 7, f. 19.
Bullina truncata, Macgilliv. Moll. Aberd. p. 191.
„ *pellucida*, Macgilliv. Moll. Aberd. p. 334 (teste Jeffreys from types), copied as *Bulla pellucida* in Brit. Marine Conch. p. 253.
Volvaria truncata, Brown, Illust. Conch. G. B. p. 4, pl. 19, f. 17, 18.
„ *retusa*, Brown, Illust. Conch. G. B. p. 4, pl. 19, f. 12, probably.
Bulla (*Tornatina*) *truncata*, A. Adams, Sowerby, Thesaur. Conch. vol. ii. p. 567, pl. 121, f. 27.

The shape of this minute and well-known shell is subcylindrical, being slightly contracted rather above the middle, and expanding towards the anterior extremity: it is abruptly truncated (yet with the edge of the last whorl rounded off, not angular) above, and well rounded below.

It is tolerably strong for the size, and of an uniform white both within and without. The upper or posterior half of its surface, which is adorned lengthways with more or less closely disposed and often curved shallow grooves, whose intervals rise in elevated and subpliciform wrinkles (that are never, as in a very closely allied species from Aden, decussated by minute spiral lines), is flattened; the lower half, which is usually more or less glossy, is smooth and convex, the basal declination being well rounded. More rarely the sulci, which in this case are almost obsolete, seem to be continued further towards the lower extremity. The crown is so broadly umbilicated as to exhibit the several gyrations, the spire which consists of two or three subplicated turns being sunken. The mouth is retort-shaped, almost linear for the upper three-fifths of its course and then more or less suddenly bulbous; it is rounded at both ends, but more particularly at the dilated one: the throat is smooth. The acute outer lip, which projects slightly above the crown, is straightish posteriorly, retuse in the middle, where it curls inwards, and well arcuated and but moderately receding anteriorly. The reflected pillar lip, which is rather broad than otherwise, is furnished with a slightly tubercular and subpliciform callosity. Our largest example does not measure the seventh of an inch, with a breadth that is decidedly not equal to the half of its length.*

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* Judging from the figure, it is not improbable that the *Volvaria pellucida* of Brown (Illust. Conch. G. B. p. 4, pl. 19, f. 45, 46) has been either constituted from a worn individual of this species or of *mammillata*. It is thus described:—"Subcylindrical, smooth, thin, pellucid, and white; aperture whole length of the body, somewhat dilating for half its extent; outer lip rising above the body, and a little thickened at its edge; superior extremity with a subumbilicus, and a very slight duplicature towards the base of the columella. Length an eighth and a half of an inch, breadth a little more than half its length. We found this on the beach at Dunbar; very rare."

The animal has been described by Dr. Johnston, and we figure it from a sketch by Mr. Alder. It is white, short and oblong. Its capital lobe is truncate in front, and terminates posteriorly in two triangular reflected tentacula at the frontal bases of which are the immersed eyes. The foot is entire, truncate anteriorly, rounded behind.

It is distributed everywhere around our shores, inhabiting the laminarian zone. It ranges from Norway to the Mediterranean, and dates from the coralline crag epoch.

C. OBTUSA, Montagu.

Small, not sulcated posteriorly: spire visible, more or less raised; the apex blunt, but not mammillary; pillar not pliciform.

Plate CXIV. c. fig. 1, 2, 3.

WALKER, Test. Minut. f. 61.

Bulla obtusa, MONT. Test. Brit. vol. i. p. 223, pl. 7, f. 3. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 128. — RACK. Dorset Catalog. p. 44, pl. 18, f. 14.—TURT. Conch. Diction. p. 23.—FLEMING, Brit. Animals, p. 293.—Brit. Marine Conch. p. 142.—DILLW. Recent Shells, vol. i. p. 497. — WOOD, Index Testaceolog. pl. 18, f. 60.—MENKE, Zeitschr. Malakoz. 1844, p. 149.

„ *Jeverensis*, SCHRÖT. Wiedmann Archiv. Zool. u Zoot. vol. iv. pt. 1 (1804), p. 16 (teste MENKE).

Utriculus obtusus, BROWN, Illust. Conch. G. B. p. 58, pl. 19, f. 5, 6.

„ *discors*, BROWN, Illust. Conch. G. B. p. 58, pl. 19, f. 3, 4.

„ *plicatus*, BROWN, Illust. Conch. G. B. p. 58, pl. 19, f. 1, 2, probably.

This abundant species chiefly varies in the greater or lesser elongation of its shape, and the corresponding height of its spire. It is small, moderately strong, subcylindrical, rarely, if ever, very narrow, of an uniform whitish or pale fulvous tint, usually dull-surfaced and opaque, and merely wrinkled (at times somewhat coarsely) by the lines of growth. The body, which is a little dilated and somewhat more ventricose below, does not taper above, but is more or less contracted in the middle, and surmounted by a visible though often barely elevated spire, which consists of three short volutions that do not regularly taper above, but are narrowly and bluntly subscalar; the apex is blunt, but not mammillary.

The suture is well marked, but is not truly canaliculated, though in the more blunt-topped examples, where the whorls are thrust inward, as it were, it occasionally has somewhat that appearance. The aperture is retort-shaped, most of the upper half being extremely narrow; it rather abruptly dilates into a bulb below, where the extremity is broad yet well rounded. The junction of the outer lip to the body is subangular, and usually takes place as far beneath the preceding suture, as the latter lies below the level of the apex; hence in some examples it is almost in a line with the summit, whilst the apex in others rises far above it. The outer lip is straightish or retuse above, where it advances, and much arcuated below, where it recedes. The curvature of the reflected pillar lip, which is rarely quite appressed, and is never pliciform, nor flanked by a distinct umbilicus, is likewise considerable. One of our larger specimens measured fully a quarter of an inch in length, and an eighth of an inch in breadth.

It ranges from low-water mark to as deep as thirty fathoms, and is frequent especially in sandy and muddy estuaries. It is generally distributed around the British coasts.

C. MAMMILLATA, Philippi.

Minute, smooth; suture canaliculated; apex mammillary; spire visible; more frequently projecting.

Plate CXIV. c. fig. 4, 5.

Bulla mammillata, PHILIPPI, Moll. Sicil. vol. i. p. 122, pl. 7, f. 20; vol. ii. p. 96. —JEFFREYS, Ann. Nat. Hist. vol. xix. p. 310.—THOMPSON, Ann. Nat. Hist. new ser. vol. iii. p. 351.

„ (*Tornatina*) *mammillata*, A. ADAMS, Sower. Thesaur. Conch. vol. ii. p. 566, pl. 121, f. 26.

„ *truncatula*, JEFFREYS, Ann. Nat. Hist. vol. xix. p. 310 (var. with sunken apex.)

Still more minute than *truncata* this cylindrical little shell exhibits so much of the general aspect of that species, that the absence of the posterior sulci, and the peculiarity of its apex are the only salient points in which it differs. The surface is smooth or merely substriated lengthways (under the microscope very perfect examples are substriated in a spiral direction); the body does not taper above, but is broadly though shallowly retuse in the middle, the upper area being as wide as the lower one. The crown is subtruncated (yet the upper edge of the body is well rounded), and is at most barely surmounted by a rather large mammillary apex, besides which a second volution almost level with the top of the body is often visible; sometimes, however, that turn, or even both, is so sunken as not to be apparent; in the former case the sutural line is narrow and canaliculated; in the latter event the nipple seems encircled by a broadish fosse. The top of the aperture is usually on a level with or above the apex; its opposite extremity is much dilated but not bulbous, as the columella, whose fold is not distinctly pronounced, slants to the left in a straightish line. There is no umbilicus behind it, but the pillar being often a little elevated, the space behind it seems then a little indented. The length of individuals is usually the tenth of an inch; their breadth is only half a line.

This species has been taken at Exmouth (Jeffreys); and Lamlash Bay, Arran, Skye, Zetland, and at Birterbuy Bay, Galway (Barlee). It ranges to the Mediterranean.

C. NITIDULA, Lovén.

Minute, subcylindrical, without the least trace of spiral striulæ; crown attenuated and rounded, without external volutions, imperforated, or very nearly so; aperture not perpendicularly raised above, but bending over the crown.

Plate CXIV. c. fig. 6.

Bulla umbilicata, MONT. Test. Brit. vol. i. pl. 7, f. 4 (not description), copied in WOOD, Index Testac. pl. 18, f. 58, and BROWN, Illust. Conch. G. B. pl. 19, f. 9 (as *Volvaria*).

Cylichna nitidula, LOVÉN, Index Moll. Scandinav. p. 10.

Bulla (*Cylichna*) *umbilicata*, A. ADAMS, Thesaur. Conch. vol. ii. p. 592, in part, pl. 125, f. 140.

Two most closely allied shells have apparently been comprehended by Montagu under the name *umbilicata*. In his description of the one for which we have reserved the name, he does not cite his own delineation of the elongated and scarcely perforated form that has been separated from the more *Bulla*-shaped and umbilicated one; hence it is not improbable that after having described a somewhat worn shell, he figured a better specimen of what seemed to him the same species.

The peculiar feature by which this species may at once be discriminated from the three next shells, is the perfect absence of all spiral striulæ; not a vestige of them can be discerned even beneath the microscope. The shell is of a pure and shining porcelain white, smooth or merely wrinkled by fine lines of growth, and of a rather elongated subcylindrical figure, the length being in general to the breadth as five is to two. Its surface is neither retusely indented above, nor is it swollen below (as in *conulus*) but is a little planulate in the middle, and thence tapers upwards so that the shape is perceptibly attenuated at the posterior extremity. The crown, which is rotundately peaked does not exhibit any external volutions, and is either absolutely imperforated or barely exhibits a slight apical chink, as the reflection of the inner lip wholly or partially covers the umbilicus; the periomphalos is solidified. The aperture, which is somewhat pear-shaped below, where the extremity is a little patulous and broadly and very bluntly rounded, is extremely narrow for the greater portion of its extent, and from the upper sweep of the outer lip, curves, and recedes as it were, over the greater portion of the crown, instead of almost perpendicularly projecting, as in the allied species. The pillar lip is narrow, rather prominent, only obscurely subpliciform, and not usually flanked by any umbilical crevice: it is more or less straight, and usually inclines to the left. Our largest example only measures two lines in length, and about three-quarters of a line in breadth.

This rare species has as yet been observed only at Croulin Island off Skye (Jeffreys); Loch Fyne (Barlee). It was found by Lovén on the coast of Sweden.

C. CONULUS, Deshayes.

Small, conoid-cylindrical; crown distinctly perforated; no volutions visible externally.

Plate CXIV. c. fig. 7.

Bulla conulus, DESHAYES, Coq. foss. des Env. de Par. p. 41, pl. 5, f. 34–36 (fide WOOD).
„ „ SEARLES WOOD, Crag Mollusca, p. 173, pl. 21, f. 2, a—c.

Mr. Jeffreys has forwarded to us a single recent example of this hitherto solely fossil species, which was dredged at Deal Voe in Zetland. It most closely approaches both the preceding and succeeding species, and is chiefly distinguished from them by its peculiarity of form, which tapers almost uniformly, with a slight central retusion, from a swollen anterior region. The crown is distinctly, though narrowly, pierced, the inner lip not being reflected over it as in *nitidula*; the narrow aperture rises with much prominence in an almost perpendicular direction above, and is somewhat bulbiform below. There is a slight indentation behind the pillar, which last is tolerably broad and subpliciform. The distant characteristic spiral striulæ, which were visible towards the lip, were replaced upon the ventral surface by superficial tawny lines, evidently appertaining to the individual, not essential to the species. The specimen measured a fifth of an inch in length, and the tenth of an inch in breadth; fossil examples attain to a quarter of an inch long, preserving the same ratio of breadth.

C. STRIGELLA, Lovén.

Minute, spirally striolated, subcylindrical; crown distinctly perforated.

Plate CXIV. c. fig. 8.

Cylichna strigella, LOVÉN, Index Moll. Scandinav. p. 10.—JEFFREYS, Ann. Nat. Hist. vol. xx. p. 16.—ALDER, Trans. Tyneside Nat. Club, 1849.
Bulla (*Cylichna*) *strigella*, A. ADAMS, Thesaur. Conch. vol. ii. p. 592, not figure.
„ (*Atys*) *ovulata*, A. ADAMS, Thesaur. Conch. vol. ii. p. 586, pl. 125, f. 118.

This minute shell so closely resembles *nitidula* that it will be sufficient to indicate the differential features, the most striking of which consists in the surface being regularly striolate, in a spiral direction, with somewhat undulated lines. The crown, which is less conspicuously attenuated than in *nitidula*, has a distinct but rather narrow perforation. The upper end of the aperture projects slightly above the level of the crown (as in *umbilicata*), and the general shape is more cylindrical than in the last-named species, and less conoid than in *conulus*.

Although we have retained this shell as a species, it is rather because we cannot disprove its specific individuality, than from a decided conviction of its distinctiveness from either the preceding or succeeding shells. When a larger number of adult individuals have been examined (which the comparative scarcity of specimens forbids at present), certain links will perhaps be then discovered, which may connect not merely the three forms, but even unite them to *nitidula*.

It was first taken in Loch Fyne by Mr. Barlee, and has been obtained since in various parts of the Scotch coast.

C. UMBILICATA, Montagu.

Minute, oblong-subcylindraceous, spirally striulate; crown not attenuated, strongly umbilicated, volutions not visible externally.

Plate CXIV. c. fig. 9.

Bulla umbilicata, MONT. Test. Brit. vol. i. p. 222 (not figure).—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 129. — TURT. Conch. Diction. p. 22 (size ?).—FLEMING, Brit. Animals, p. 293.—Brit. Marine Conch. p. 141.—DILLW. Recent Shells, vol. i. p. 497. — GRATEL. Sur les Bull. (and in Bull. Bordeaux), p. 23.

Bullina „ MACGILLIV. Moll. Aberd. p. 190, probably.

Volvaria „ BROWN, Illust. Conch. G. B. p. 3, not figure.

„ *subcylindrica*, BROWN, Illust. Conch. G. B. p. 3, pl. 19, f. 19, 20.—THOMPSON, Ann. Nat. Hist. vol. xv. p. 315.

The strong apical perforation, the broader and less produced shape, the absence of all posterior attenuation, or anterior tumidity, seem the combined characters by which the present form may be distinguished from the three preceding ones. Instead of being planulate or retuse in the middle it is more or less ventricose; hence the outer lip is more equably curved, neither being perceptibly contracted in the middle, nor swollen below. When perfectly fresh, more or less distinct, though at times interrupted, spiral striulæ are rendered visible by a powerful lens, but not being deeply graven are easily worn away, so that the majority of specimens appear smooth. The aperture scarcely bends over the crown so much as in *nitidula*, nor does it project above so much as in *conulus*. Occasionally there is a slight chink behind the pillar lip, which in the more characteristic specimens is subpliciform and arches a little to the right at its anterior extremity, so as to render the base of the aperture more truly rounded (not merely obtuse) than in its allied congeners. The length somewhat exceeds the eighth of an inch; the breadth is bare three-fourths of a single line.

This species ranges from low water-mark to great depths, and is sparingly distributed around the British shores, ranging from the British Channel to Zetland, and living on both eastern and western coasts.

To this genus belongs the *Volvaria alba* of Brown (Ill. Conch. G. B. p. 3, pl. 19, f. 43, 44), said to have been found at Greenock, and usually supposed to be (as British) a fossil species. The *Cylichna alba* of Lovén ("Index," p. 10, figured in the "Thesaurus Conchyliorum," vol. ii. pl. 125, f. 137, from a specimen sent by Lovén to England) seems identical, and to be the same with the *Sarsii* of Adams' monograph (Thes. Conch. pl. 125, f. 135). The *B. triticea* of Couthouy (Bost. Journ. vol. ii. p. 88, pl. 2, f. 8; Gould, Invert. Massach. p. 165, f. 98; Thes. Conch. pl. 107, f. 139), stated by Möller and Lovén to be the *corticata* of the former (Ind. Moll. Grœnl. p. 6) is most closely allied to it, even if not a synonym.

AMPHISPHYRA. Lovén.

Shell thin, inflated, ovate or subglobose; apex truncate; whorls of spire exposed, depressed, with a mammilated nucleus; aperture expanded, not extending above the body-whorl, outer lip sinuous, produced, inferiorly retiring at its junction above; pillar lip subumbilicated. No operculum.

Animal capable of being entirely retracted within the shell; its head broad and short, flanked by two distant triangular tentacula, and bearing two immersed eyes some way above their bases. Tongue broad, armed; axile denticle, broadly quadrate, with its upper edge inflected and serrulate; flanked on each side by a single hamate lateral with a broad base. No gizzard. Foot broad, truncate, and sub-bilobate in front, shorter than the shell, and unequally bilobed behind.

A. HYALINA, Turton.

Plate CXIV. D. fig. 1, 2, and (Animal), Plate U. U. fig. 2.

Bulla hyalina, TURT. (not of GMELIN, which is merely from MARTINI Conch. Cab. vol. i. f. 199), Mag. Nat. Hist. (Loudon's), vol. vii. p. 353.—Brit. Marine Conch. p. 141.—THOMPSON, Ann. Nat. vol. xv. p. 314.
Diaphana pellucida, JOHNSTON, Berwick. Club, vol. ii. p. 32.
„ *candida*, JOHNSTON, Berwick. Club, vol. ii. p. 32, fry, probably.
Bulla minuta, MACG. Moll. Aberd. p. 334, copied, Brit. Marine Conch. p. 252, fry, teste JEFFREYS, from type.
Utriculus minutus, BROWN, Illust. Conch. G. B. p. 58, pl. 19, f. 7, 8, fry.
„ *candidus*, BROWN, Illust. Conch. G. B. p. 59, pl. 19, f. 13, 14, young.
„ *hyalinus*, BROWN, Illust. Conch. G. B. p. 59.
„ *pellucidus*, BROWN, Illust. Conch. G. B. p. 59, pl. 19, f. 10, 11.
Amphisphyra pellucida, LOVÉN, Index Moll. Scandin. from type.
„ *hyalina*, ALDER, Cat. Moll. Northumb. and Durh. p. 28.
Bulla (*Utriculus*) *pellucida*, A. ADAMS, Sowerby, Thesaur. Conch. vol. ii. p. 571, pl. 120, f. 21.

This minute and very fragile shell is thin and semi-transparent, smooth or nearly so, of a pure and glossy white, and of an oblique broadly oval figure, that is sub-truncated posteriorly, and is well rounded at the anterior extremity. It is composed of from three to four volutions (usually the former number only), of which the body, which is inflated, although often a little flattened near the suture, and at times subretuse in the middle, is somewhat rounded below. The crown is nearly truncated; but the mamillary apex almost always projects a little above it, though the whorls of the spire, which are extremely short, rather broadly and in general retusely flat-topped, and very distinctly pronounced owing to that circumstance and the abrupt perpendicularity of their rise, are usually more or less sunken. The mouth is capacious, becoming so quickly dilated anteriorly, as to fill nearly one half of the ventral area: above, it is almost (yet not quite) on a level with the top of the last volution, and is square-topped and narrow, being contracted posteriorly by the swell of the body. The outer lip, which is acute and simple, there being no actual fissure, though in the adult a rather broad excised area (as in *Akera*) is produced near the suture by the advance of the labial edge, juts out for a very short distance at a right angle to the body, then suddenly advances and slants downwards, and finally arches considerably, so as to round off the lower end of the aperture. An umbilical crevice is partially concealed by the raised and slightly reflected edge of the pillar, which latter is straightish, inclines a little to the left, and occupies at most one half the length of the aperture. Our largest example was two lines and a quarter long; its breadth was a line and a half.*

The animal is white, and entirely retractile. Mr. Alder remarks that it keeps its eyes under the protection of the transparent shell, through which it looks as through a window.

Specimens are most frequently procured from shell sand. Mr. Alder has found it alive in pools between tide marks at Cullercoats. We have taken it alive from the roots of *Laminariæ* in Zetland, and dead in as deep as thirty fathoms (E. F.); Scarborough (Bean); Weymouth and Devon, Bristol Channel (Jeffreys); Loch Fyne and Hebrides (Barlee); Portmarnock (Warren); Cork (Humphreys); Donegal (Mrs. Hancock).

It ranges northwards to the shores of Norway, and is probably distributed through the Arctic and Boreal seas.

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* We can scarcely perceive an appreciable difference between this species and the *Bulla debilis* of Gould (Invert. Massach. p. 164, f. 95), which last is declared by Möller to be his *B. subangulata* (Index Moll. Grœnl. p. 6.)

TORNATELLA. Lamarck.

Shell solid, ovate, subcylindrical, more or less spirally striated, rarely smooth; spire produced; aperture narrow, expanding and rounded below; pillar lip spirally contorted, with a fold. Operculum corneous, elliptical.

Animal not investing the shell; its head is a quadrate disk, bilobed in front, and bearing two broad obtuse semicircular lobate tentacula capable of reflection on the shell posteally; at the upper or inner bases of which are impressed two small eyes. No central teeth on tongue, many uncinated laterals. Mantle closed in front, its lateral lobes slightly reflected on the shell; branchial plume single. Male organ long, cylindrical, reflected. Foot oblong, truncate in front, obtuse behind.

This genus is probably the most ancient in point of appearance in time of its tribe. So much confusion attaches to the name *Acteon*, applied to it by De Montfort, that we have preferred its Lamarckian appellation.

T. fasciata, Linnæus.

Plate CXIV. d. fig. 3, and (Animal) Plate V. V. fig. 7.

Knorr, Délices des Yeux, vol. vi. pl. 19, f. 4.—Encycl. Méth. Vers, pl. 452, div. 1, f. 3.

Voluta tornatilis, Linn. Syst. Nat. ed. 12, p. 1187.—Penn. Brit. Zool. ed. 4, vol. iv. p. 117, pl. 71, f. 86.—Pulteney, Hutchins, Hist. Dorset, p. 41.—Donov. Brit. Shells, vol. ii. pl. 57; in Rees' Cycl. Conch. pl. 1 (1803).—Mont. Test. Brit. vol. ii. p. 231.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 129.—Rack. Dorset Catalog. p. 44, pl. 14, f. 2.—Turt. Conch. Diction. p. 249, f. 32, 33.—Olivi, Zool. Adriat. p. 141.—Dillw. Recent Shells, vol. i. p. 503.—Wood, Index Testac. pl. 19, f. 11.—Chiaje, Poli Test. Sicil. vol. iii. pt. 2, p. 34, pl. 46, f. 47, 48.

Auricula, &c. MARTINI, Conch. Cab. vol. ii. p. 125, pl. 43, f. 442, 443.
Turbo ovalis, DA COSTA, Brit. Conch. p. 101, pl. 8, f. 2.
Bulimus tornatilis, BRUG. Encyc. Méth. Vers, vol. i. p. 338.
Tornatella fasciata, LAM. Anim. s. Vert. (ed. Desh.) vol. ix. p. 41.—JOHNSTON, Report Berwick. Club, vol. i. p. 274.—Brit. Marine Conch. p. 156.—BROWN, Illust. Conch. G. B. p. 21, pl. 8, f. 4, 5. —BLAINV. Man. Malacol. pl. 38, f. 5.—CROUCH, Introd. Conch. pl. 16, f. 8. — KIENER, Coq. Vivant. Torn. p. 5, pl. 1, f. 3; transl. Storer, p. 5. — PHILIPPI, Moll. Sicil. vol. i. p. 166.—REEVE, Conch. Syst. vol. ii. pl. 206, f. 11. —CUVIER, Règne Anim. (ed. Croch.) pl. 45, f. 5.
„ *tornatilis*, FLEMING, Brit. Anim. p. 336.—MACGILLIV. Moll. Aberd. p. 158.—PHILIPPI, Moll. Sicil. vol. ii. p. 143.
Speo bifasciatus, RISSO, Hist. Nat. Europe Mérid. vol. iv. p. 236, f. 107.
Tornatella pellucida and *pusilla*, MACGILLIV. Moll. Aberd. p. 158, 159; copied, Brit. Marine Conch. p. 254, and BROWN, Ill. Conch. G. B. p. 129 (immature, teste Jeffreys, from types).
Actæon tornatilis, ALDER, Cat. Moll. Northumb. and Durh. p. 29, animal.

The shell, which is strong and has a somewhat oval form, that is acuminated above, and rotundately tapers below, is of a rather glossy pale lilac red, or of a livid pinkish flesh colour; the whorls are very narrowly edged with white beneath the suture. Of the two whitish or pallid fillets, that are usually present on the body of our native examples (though the anterior one is occasionally obsolete, and both are absent in a rare Mediterranean variety), and which vary as to width (yet are never very broad) in different individuals, the upper which is more frequently (yet not always) the narrower, and is often continued on the base of the smaller turns, runs in a line with the top of the aperture; the lower revolves half way between the superior one and the anterior extremity. The entire exterior is striated in a spiral direction: the striæ, which are very fine and densely disposed upon the middle of the shell, but at the lower end, where their intervals are raised in a somewhat costellar fashion, dilate into more distant sulci, are often rendered tremulous by the wrinkles of increase, and beneath a powerful lens appear dotted or crossed lengthways by minute raised lines. The spire, which is rather quickly attenuated to a very acute and symmetrically coiled apex, is composed of seven convex or somewhat rounded short volutions, that are of moderate longitudinal increase, and taper regularly above, where they bend over the fine but canaliculated suture that divides them from each other. The body, which is more or less ventricose, and instead of being cylindrical is swollen towards the middle, is convex in surface, and has both declinations more or less rounded. The mouth occupies two-thirds of the total length, and is curved, and somewhat horn-shaped; it is very acutely peaked above, and widening gradually, is most dilated nearly opposite to (but slightly above) the columellar fold; the lower end is prominent, a little patulous, and rather narrowly rounded. The throat, which faintly exhibits the external colouring, is quite smooth. The acute and simple outer lip is moderately but uninterruptedly arcuated, and recedes but little anteriorly. The pillar lip, which is white, broadly reflected, not quite appressed, and a little convex in surface, is furnished with a large and prominent fold, which is seated so high up, that the incurved portion of the columella below it is rather produced. The breadth in one of our larger examples, which was five-sixths of an inch long, was nearly five lines.

The animal, the form of whose parts is as described in the generic character, is of a milky white hue. When walking, it bears its capital lobe partly in advance of the foot. It is active, and by no means shy, not retracting its body when overturned. When handled it gives out a milky fluid with a purplish tinge. The operculum is large and sufficiently conspicuous.

This pretty mollusk inhabits sandy ground, and ranges from the verge of low water to as deep as sixty and more fathoms. It is distributed through all the provinces of the British seas. It ranges from the coasts of Norway to the Mediterranean. It dates its history from the coralline crag epoch.

SPURIOUS?

Voluta heteroclita, MONT. Test. Brit. Suppl. p. 169. — LASKEY, Mem. Werner. Soc. vol. i. pl. 8, f. 12.—TURT. Conch. Diction. p. 254.
Acteon „ FLEMING, Brit. Animals, p. 337.
Auricula „ Brit. Marine Conch. p. 146.

Of this curious shell, the true generic position of which is doubtful, we have seen but a single specimen, the example originally figured by Laskey and described by Montagu; which was purchased at the sale of the former's collection by Professor Forbes. It is of a narrow elongated-oblong shape, is subcylindraceous, yet gradually attenuated towards the blunt-topped apex, is not very thin nor transparent, and is both within and without of an uniform ivory white. The surface is smooth and glossy, but this may be the effect of attrition, as there are indistinct traces of numerous wrinkles of increase. The whorls are sinistral, nearly eight in number, and although not flat, yet so little convex as to merely overlap each other at the oblique and clearly defined, though simple, suture; the earlier ones are very short, and moderately tapering; the lower ones scarcely taper at all, but are of moderate longitudinal increase. The body, which is not at all ventricose, is about equal in length to the spire; it is attenuated below, with a rounded basal declination. The oblique aperture is of an extremely narrow pear-shape, being somewhat rounded below, and very gradually and acutely contracted above. The outer lip, which is simple, acute, convex above, and arcuated below, where it recedes anteriorly, is not at all prominent. The inner lip, whose course is a little convex above, and somewhat incurved below, is narrowly and appressly reflected; it is furnished rather below the middle with a single very strong curved horizontal toothlike fold; the pillar is subtruncated at the base. The individual measured nearly two lines and a half in length, and about nine-tenths of a line in breadth. It was stated by Laskey to have been taken near Dunbar, along with numerous other shells which subsequent investigations have proved to be exotic, and reminds one of a sinistral *Tornatellina.*

AKERA. O. F. MÜLLER.

Shell very thin, elastic, convolute, ovate, ventricose; spire truncated; margin of the outer whorl disjoined from the suture; aperture elongate, pyriform, its basal margin rounded; pillar lip excavated. No operculum.

Animal elongated, subcylindrical; not completely investing the shell but covering it in great part by its large lateral lobes; capital lobe short, truncated in front, subtriangular and entire behind. No eyes. Tongue armed with a single series of small axile denticles flanked by numerous narrow hamate laterals. According to Lovén, a long, slender filiform process of the mantle is lodged in the canal of the spire. The gizzard is set with triangular horny tubercles like that of *Aplysia.*

Members of this genus are found in the seas of both northern and southern hemisphere, and within the tropics.

A. BULLATA, Müller.

Plate CXIV. D. fig. 4, 5, 6, and (Animal) Plate V. V. fig. 6.

Akera bullata, MÜLLER, Zool. Danica, pl. 71, f. 1 to 5.

Bulla voluta parva, CHEMNITZ, Conch. Cab. vol. x. p. 122, pl. 146, f. 1358.

„ *Akera*, GMELIN, Syst. Nat. p. 3434.—MONT. Test. Brit. vol. i. p. 219.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 125.—RACK. Dorset Catalog. p. 43, pl. 22, f. 13. — TURT. Conch. Diction. p. 21.—FLEMING, Brit. Animals, p. 292.—Brit. Marine Conch. p. 139.—DILLW. Recent Shells, vol. i. p. 482.—WOOD, Index Testac. pl. 18, f. 23.

Bulla Norwegica, BRUGUIERE, Encycl. Méth. Vers, vol. i. p. 377, pl. 360, f. 4.—

Bosc, Hist. Nat. Coquil. vol. iv. p. 69. — GRATEL. Sur les Bull. (and in Bullet. Bordeaux), p. 14, var. *a*.

Bulla resiliens, DONOV. Brit. Shells, vol. iii. pl. 79.

„ *fragilis*, LAM. Anim. s. Vert. (ed. Desh.) vol. vii. p. 672.—BLAINV. Man. Malacol. pl. 45, f. 7. — CUVIER (ed. Henderson), pl. 16, tert. f. 6.—Penny Cyclopæd. vol. vi. figure at p. 12.—SOWERBY, Conch. Man. f. 247.

Akera flexilis, BROWN, Illust. Conch. G. B. p. 59, pl. 19, f. 31, 32.

Bulla (*Akera*) *bullata*, A. ADAMS, Sow. Thesaur. Conch. vol. ii. p. 572, pl. 121, f. 41.

„ „ *Hanleyi*, A. ADAMS, Sow. Thesaur. Conch. vol. ii. p. 573, pl. 121, f. 46.

The shape of this horn-coloured shell ranges from oval to rounded oval, the form being usually more produced in such individuals as have an elevated spire. The texture is very thin, somewhat membranaceous, and when fresh-taken even elastic; the surface is glossy, and smooth to the eye, but in reality is most densely set with minute spiral striulæ. The body which is tumid, and simply rounded, not being retusely indented, although it appears to closely embrace the preceding volution, is nevertheless severed from it above, by a narrow fissure, which runs parallel to the suture, at a little distance from it, along the highest part of the body, so that only a kind of ledge, which, indeed, is wholly cut away for a considerable space near the outer lip, is actually attached to the preceding coil. This ledge, when the crown is sunken or level, shelves inwards; when it is a little raised (which is rarely the case in the largest examples), is then nearly horizontal; hence the volutions are angulated above, and their tops are either flat, retuse, or subcanaliculated; the sides of the whorls are rounded up to the angle, and frequently lean, as it were, over the subscalar portion. From the rapidity of the volutional increase the aperture is ample, occupying about one-half of the ventral area; it is of an oblique and elongated pear shape, and (except in the more produced forms, where the mouth is altogether narrower) is broadly rounded below, and gradually attenuates upwards from the swell of the body-whorl. The outer lip is simply arcuated, and inclined to curl inwards; its posterior advance and anterior recession are both considerable. The pillar, which is peculiarly incurved, is so cut away as to display the internal structure; it is white, very narrow, and a little reflected, but not flanked by any umbilical crevice. Some of the large Irish specimens attain to an inch and an eighth in length, and almost seven-eighths of an inch in width.

The animal is of an elongated subcylindrical shape, limaciform in front, truncated behind. The mantle lobes are very large and elongated; they meet just in front of the centre of the shell. The head lobe is short and oblong, truncated in front, and triangular posteally. There are no eyes. The whole body is deeply tinged and mottled with purple, or with brown.

It inhabits the littoral zone, ranging between one and fifteen fathoms, usually among weed. It has a wide range, but is only locally abundant. About four miles from Portland bridge, the mud, at high-water mark, is fringed with thousands of them (S. H.). Southampton (Jeffreys); Poole (Barlee); Hebrides (Jeffreys); Orkney, as in Kirkwall Bay, ten fathoms (E. F.). In five fathoms, Unst, Zetland (M'Andrew). Common in oozy bays of the north, east, and west of Ireland (W. Thompson). The figure is taken from a specimen dredged in three fathoms water, Clew Bay, Galway (E. F.). Bantry Bay (Mrs. Puxley).

It ranges from Norway to the Mediterranean.

BULLA. Linnæus.

Shell ventricose, subglobose, oblong, inflated, convolute; spire involute; surface smooth, striated or punctate; aperture narrow superiorly, ovate below. No operculum.

Animal bulky, partially investing but not covering the shell; capital lobe large, truncated in front, bilobed posteally, furnished (except in *B. Cranchii*) with immersed eyes towards the centre of the disk; lateral lobes very large, reflected on shell; a more or less developed caudal lobe reflected on the spire; foot large quadrate, extending beyond the shell posteriorly; gizzard armed with calcareous plates; tongue without axile plate, but armed with numerous laterals; branchial plume single. Individuals hermaphrodite; male organ retracted.

The animals of this genus are capable of swimming with ease by means of their large lateral lobes, whilst their extensive foot enables them to crawl with equal facility.

B. hydatis, Linnæus.

Oval-globose, extremely thin, merely undulated spirally by very minute and crowded simple striulæ; usually covered with a yellowish skin.

Plate CXIV. d. fig. 7, and (Animal) Plate U. U. fig. 3.

Bulla hydatis, Linn. Syst. Nat. ed. 12, p. 1183, probably.—Pulteney, Hutchins, Hist. Dorset. p. 40.—Donov. Brit. Shells, vol. iii. pl. 88.—Mont. Test. Brit. vol. i. p. 217, vign. 1, f. 1 to 4; Suppl. p. 94, animal.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 123.—Rack. Dorset Catalog. p. 43, pl. 23, f. 10.—Turt. Conch. Diction. p. 20.—Fleming, Brit. Anim. p. 292.—Brit. Marine Conch. p. 139.—Brown, Illust. Conch. G. B. p. 57, pl. 19, f. 29, 30.—Brug. Encycl. Méth. Vers, vol. i. p. 374.—Cuvier, Ann. du Mus. vol. i. pl. 12, f. 11 to 14 and 21.—

Dillw. Recent Shells, vol. i. p. 479. — Wood, Index Testac. pl. 18, f. 17.—Blainv. Man. Malacol. pl. 45, f. 1.

Bulla ampulla (not of Linn.), Penn. Brit. Zool. ed. 4, vol. iv. p. 116?

„ *navicula*, Da Costa, Brit. Conch. p. 28, pl. 1, f. 10.

„ *cornea*, Lam. Anim. s. Vert. (ed. Desh.) vol. vii. p. 672. — Deles. Rec. Coq. Lam. pl. 27, f. 7.

„ (*Haminea*) *hydatis*, A. Adams, Sow. Thesaur. Conch. vol. ii. p. 578, pl. 124, f. 81, 82.

As some little doubt exists whether the small oval Mediterranean examples,* with a more indented crown, be or be not identical with our ordinary rounded and tumid form, we have so framed our synonymy as solely to apply (the reference to Linnæus excepted) to the latter, which, as Da Costa named anew, whilst acknowledging it to be the *hydatis* of Linnæus, must take the name of *cornea*, if regarded as specifically distinct. Both forms, however, appear to exist in the Mediterranean, and if we may trust to the indigenousness of certain examples in the hands of collectors, both are likewise taken upon our own coast.

The shell, which is very thin and semitransparent, has a rounded ovate contour, and is neither contracted nor truncated posteriorly: it is covered by a yellowish or ferruginous skin (that is shining and pellucid in the young, but is occasionally opaque and dull in the more aged individuals), beneath which the surface, which is most densely encircled throughout with most minute and slightly undulated spiral striulæ, is of an uniform whitish or pale yellowish cast. The body, which is ventricose or even tumid, and whose slopes are well rounded at both ends, is not surmounted by any spire; its crown displays a slight umbilical indentation, but no true perforation. The curved and somewhat capacious aperture is moderately open throughout, but enlarges decidedly anteriorly, owing to the great incurvation of the broad and appressly reflected pillar lip; it is slightly elevated above the crown posteriorly, and is rounded at both extremities, but more especially at the anterior one, which is broad, but not at all obtuse. The simple and acute edge of the outer lip, which is regularly arcuated throughout, but is perhaps a little straightened, not however retuse in the middle, advances a little above, and recedes but little below. Full-sized specimens measure, on the average, nearly an inch in length, and about a third less at the broadest part.

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* Delle Chiaje in Poli, Test. Sicil. vol. iii. pt. 2, p. 26, pl. 46, f. 28.

The animal is massive and of slug-like appearance and consistency when in motion. It is of a general yellowish or olivaceous hue, speckled all over with minute sand-like spots of brown, black, and yellow. The capital lobe is large, and when fully expanded, as represented in our figure, from a beautiful drawing communicated by Mr. Alder, is ovate-triangular, but when partially contracted exhibits a distinct bilobation of its posteal or tentacular portion; these tentacular lobes are rounded. On the frontal portion of the disk are two closely set immersed dark eyes, with pale areolæ. The lateral lobes are very large and rounded; they meet on the front of the shell: the supra-caudal (equivalent to opercular) lobe is large, and reflected on the spire; the extremity of the foot is broad and somewhat bilobed. Individuals of the variety *cornea,* taken by us in the Mediterranean, had the soft parts much paler, with scattered vivid yellowish or tawny dots.

This is mainly a southern species in the British seas, and on the whole must be regarded as among our less common shells. It inhabits the Laminarian zone. Exmouth (Clark); Southampton (Rootsey); Poole (Dillwyn); Weymouth (Jeffreys); Falmouth (Cocks, Alder); Salcombe (Barlee); Pembrokeshire (Jeffreys); Cork (Humphreys); Galway (Farran). An exceptional locality in the range is Scarborough (Bean).

It extends to the Mediterranean, where it is a common shell on the verge of water-mark.

B. Cranchii, Leach.

Elliptic, milk-white, spirally striated with impressed dots.

Plate CXIV. d. fig. 8, 9, and (Animal) Plate V. V. fig. 2.

Bulla Cranchii, Leach in Fleming's Brit. Animals, p. 292.—Johnston, Berwick. Club, vol. ii. p. 30.—Macgilliv. Moll. Aberd. p. 188.—Brit. Marine Conch. p. 140, f. 20. — Brown, Illust. Conch. G. B. p. 57.—Alder, Cat. Moll. Northumb. and Durh. p. 27.
„ *punctura*, Johnston, Edinb. New Philos. Journ. April, 1828, p. 79, teste Johnston.
„ *striata*, Brown, Illust. Conch. G. B. p. 57, pl. 19, f. 41, 42?
Scaphander Cranchii, Lovén, Index Moll. Scand. p. 10?

The shell has an elliptical form, is bluntish and finely perforated above, and narrowed below; it is neither pellucid, very thin, nor tumid, and is of a glossy milk-white hue, often stained when young by a ferruginous coating, and covered when adult by a very thin oil-yellow skin. Although the entire exterior is densely striated by numerous spiral series of minute impressed dots, they are so faint, small, and isolated upon the middle portion of the younger specimens, as to seem almost obsolete; the two extremities, especially the anterior one, are likewise encircled by rather distant narrow sulci. The aperture is curved and somewhat horn-shaped; it gradually dilates from above as far down as the junction of the pillar to the body, after which it is again slightly contracted by the curve of the outer lip. This last, which is somewhat raised above the crown posteriorly, is moderately and equally arcuated throughout. The pillar lip, which is flanked by a subumbilicus, or else a strongly-marked indentation, is peculiarly long, solid, slightly tortuous, and almost perpendicular. Fine specimens occasionally measure five-eighths of an inch in length, and three-eighths in breadth; such individuals, however, are very rarely obtained.

The animal is rather firm in its texture. It is entirely white. The capital disk is very large, truncate in front, strongly bilobed posteally, lobes somewhat ovate lanceolate. We could find no eyes in this disk. Lateral lobes large, but not meeting upon the shell; supracaudal lobe truncate, reflected on the spire; foot quadrate and slightly bilobed behind. The gizzard is seen shining through the shell.

This, though among our scarcer shells, has a wide distribution from north to south, as well as a great range extending from the lower verge of the Laminarian zone to as deep as one hundred fathoms. Mr. Jeffreys has it from Torbay and Plymouth, in the Turtonian collection. Scarborough (Bean); Whitburn, Northumberland (Alder); Berwick (Johnston); Aberdeen (Macgillivray); Loch Fyne (Barlee), where we have dredged it in fifty fathoms; also in twenty and forty fathoms in the Hebrides; and in sixty, eighty, and one hundred fathoms at Zetland (M'Andrew and E. F.). Cork Harbour (Humphreys); West of Ireland (Barlee).

SPURIOUS.*

Bulla media, Philippi.

Lister, Hist. Conch. pl. 714, f. 72. — Gualt. Test. Mus. pl. 12, f. H. probably.—Gronov. Zoophyl. p. 294, no. 1295, chiefly.
Bulla striata, Brug. Encycl. Méth. Vers, vol. i. p. 372, chiefly. — Brit. Marine Conch. p. 140.—Bosc, Hist. Nat. Coquilles, vol. iv. p. 67, chiefly. —Lam. Anim. s. Vert. (ed. Desh.) vol. vii. p. 668, chiefly.
„ *ampulla*, Mont. (not Linn.) Test. Brit. p. 206, pl. 7, f. 1. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 124, in part. — Turt. Conch. Diction. p. 21.—Fleming, Brit. Anim. p. 293.
„ *amygdalus*, Solander, in Dillw. Recent Shells, vol. i. p. 480, chiefly.
„ *media*, Phil. Zeitsch. Malak. 1847, p. 121. — A. Adams, Sow. Thesaur. Conch. vol. ii. p. 576, pl. 123, f. 70.

A most abundant West Indian shell, introduced by Montagu as from sand in Falmouth harbour. If the name striata, *applied by Bruguiere to both this and the succeeding species, should be retained at all, we think, from his account of the striæ, that it should be kept rather for this shell than for the Mediterranean one.*

B. columnæ, Chiaje.

Gualt. Test. Mus. pl. 12, f. F (probably).
Bulla striata, Brug. Encycl. Méth. Vers, vol. i. p. 372, in part only.—Philippi, Moll. Sicil. vol. i. p. 121; vol. ii. p. 95.
„ *alba*, Turt. Zool. Journ. vol. ii. (1825), p. 364, pl. 13, f. 6. — Fleming, Brit. Animals, p. 294.—Brit. Marine Conch. p. 142.—Brown, Illust. Conch. G. B. p. 56, pl. 19, f. 47.
„ *Columnæ*, Chiaje (1826), Poli, Test. Sicil. vol. iii. pt. 2, p. 24, pl. 46, f. 17, 18.
„ *amygdalus*, A. Adams, Sow. Thes. Conch. vol. ii. p. 375, pl. 122, f. 63.

A Mediterranean species, stated to have been dredged (dead) in the Channel by Dr. Turton, who was the first to remark its specific distinctness from the preceding shell. His name, however, is so utterly unsuited to the specific characters, that we have preferred the one soon after applied to it by Chiaje.

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[*] The *B. elegans* of Gray (Annals of Philos. 1825, p. 408; Index Testac. Suppl. pl. 3, Bul. f. 2; *B. Guildingii*, A. Adams. Thesaur. Conch. vol. ii. p. 580, pl. 124, f. 87, 88, 89, erroneously stated to be a British species, is a native of the W. Indies.

SCAPHANDER. Montfort.

Shell ovato-pyriform, convolute, narrowed above, expanded below; spire depressed; aperture contracted above, patulous below, not canaliculated. No operculum.

Animal not investing the shell, bulky, capital disk large, quadrate, lateral lobes small, foot ample but short. No eyes. Gizzard of thin calcareous plates. Axis of the tongue unarmed, its lateral membrane armed each with a single series of uncinated teeth.

The gizzard of *Scaphander* is a remarkable object, and has more than once, when found apart from the animal, been elevated to the rank of a separate genus, and considered as an independent mollusk. The spurious genus, *Gioenia*, had such an origin.

S. lignarius, Linnæus.

Plate CXIV. f. fig. 3, and (Animal) Plate V. V. fig. 5.

Lister, Hist. Conch. pl. 714, f. 71.—Encycl. Méth. Vers, pl. 359, f. 3.

Bulla lignaria, Linn. Syst. Nat. ed. 12, p. 1184. — Penn. Brit. Zool. ed. 4, vol. iv. p. 116, pl. 70, f. 83.—Da Costa, Brit. Conch. p. 26, pl. 1, f. 9. — Pulteney, Hutchins, Hist. Dorset, p. 40. — Donov. Brit. Shells, vol. i. pl. 27; in Rees' Cyclop. Conch. pl. 11, A.—Mont. Test. Brit. vol. i. p. 205; Suppl. p. 92.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 125.—Rack. Dorset Catalog. p. 43, pl. 23, f. 9. — Turt. Conch. Diction. p. 19. — Fleming, Brit. Animals, p. 292. — Brit. Marine Conch. p. 138. — Brown, Illust. Conch. G. B. p. 56, pl. 19, f. 23, 24. — Born, Test. Mus. Vind. p. 203. — Olivi, Zool. Adriat. p. 137. — Brug. Encycl. Méth. Vers, vol. i. p. 379.—Cuvier, Ann. du Mus. vol. xvi. pl. 1, f. 7, 8, 9, 10, 23, animal.—Dillw. Recent Shells, vol. i. p. 480.—Wood, Index Testac. pl. 18, f. 20.—Lam. Anim. s. Vert. (ed. Desh.) vol. vii. p. 667. — Sowerby, Genera Shells, Bulla, f. 3. — Blainv. Man. Malacol. pl. 45, f. 8. — Philippi, Moll. Sicil. vol. i. p. 121; vol. ii. p. 95.—Sowerby, Conch. Man. f. 251.

—Reeve, Conch. Syst. vol. ii. pl. 153, f. 5.—Cuvier, Règne Anim. (ed. Croch.) Moll. pl. 36, f. 3. — Wood, Crag Moll. vol. i. p. 173, pl. 21, f. 8.

Bulla oblonga, &c., Martini, Conch. Cab. vol. i. p. 283, pl. 21, f. 194, 195.

Bullæa lignaria, Gray, Annals Philos. 1825, p. 408.

Bulla (*Scaphander*) *lignarius*, A. Adams, Sow. Thesaur. Conch. vol. ii. p. 574, pl. 121, f. 47.

The name of this early-observed species is derived from the peculiarity of its colouring, which bears some likeness to the parallel fibres of a pale tinted wood. The shell has a narrow ovate-oblong figure, being taper and much contracted above, and dilated below; it is loosely coiled, and rather depressed; but the lower medial surface is moderately ventricose and well rounded; the area above it is almost imperceptibly and diffusely retuse. It is moderately strong, not pellucid, and of a rather pale orange tawny hue (rendered more intense by the glossy epidermidal skin), and is spirally adorned throughout by white or pallid deeply and rather broadly incised striæ, that are rather remote upon the whole, but set at irregular distances, the intervals being shorter towards the two extremities; these lines exhibit a somewhat dotted appearance beneath the lens; sometimes, too, the wrinkles of growth are strongly marked. There is no vestige of a spire, for the crown is obliquely truncated, and is indented, though not umbilicated. The aperture is capacious, filling more than half the ventral area; it is of a porcelain white, and devoid of sculpture; it occupies the full length of the shell, and is of a curved and produced pear-shape, being narrow and somewhat square-topped above, broadly yet not bluntly rounded and greatly expanded below. The acute edge of the outer lip, which rises in a straightish or slightly retuse line a little above the level of the crown (which latter is encircled by a narrow fillet of white) inclines a little inward above, where its course is slanting and subrectilinear, and recedes considerably below, where it is greatly arcuated and disposed to expand. The white pillar lip, whose internal gyration is visible to the extreme apex, projects at its free edge, is not very broad, and is much incurved. Individuals attain to two inches and a half in length, and an inch and a half in breadth.*

The animal is bulky, but not longer than the shell posteriorly. It is entirely of a pinkish or orange-tinted white. The capital disk is quadrate and very large, the lateral lobes comparatively small. There are no traces of eyes. The shell is completely exposed.

This mollusk lives, chiefly on sandy ground, at various depths between one and fifty fathoms. It is distributed all through the British seas, but not always plentifully, and in some of our provinces it is local. It ranges through the European seas. As a fossil it probably dates its history from the coralline crag epoch.

PHILINE. Ascanius. BULLÆA. Lamarck.

Shell thin, fragile, smooth, frosted, striated or punctated, translucent, loosely convolute, suborbicular or ovate, aperture very wide and open, outer lip patulous; spire small, often concealed. No operculum.

Animal investing the shell, large, slimy; capital disk oblong or subquadrate, no eyes nor tentacula; lateral lobes developed; foot not produced posteriorly; branchial plume single; gizzard armed with testaceous plates; tongue without axile teeth, laterals in single or double file. Hermaphrodite.

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* Mr. Jeffreys informs us, that the *B. zonaria* of Turton (Mag. Nat. Hist. vol. vii. p. 352, copied in Brit. Marine Conch. p. 140, and Brown, Ill. Conch. G. B. p. 56), described from a specimen in the collection of Mr. Clark (which passed into his hands along with Turton's), was merely constituted from the fry of *lignaria*. We have never seen a specimen, however, that could truly be said to be encircled by minute raised granular dots.

The name *Philine* was applied to this excellent genus by Ascanius, and *Lobaria* by Müller. Lamarck's appellation has, however, become so established, that the older names are seldom used.

P. APERTA, Linnæus.

Moderately large, only sculptured by lines of growth.

Plate CXIV. E. fig. 1, and (Animal) Plate U. U. fig. 1.

PLANCUS, De Conchis, pl. 11, f. D, E, F, G.

Bulla aperta, LINN. Syst. Nat. ed. 12, p. 1183, in part.—PULTENEY, Hutchins, Hist. Dorset, p. 40.—DONOV. Brit. Shells, vol. iv. pl. 120, f. 1. —MONT. Test. Brit. p. 208, vign. 2, f. 1, 2, 3, 4, and Suppl. p. 94.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 121. — RACK. Dorset Catalog. p. 43, pl. 22, f. 3. — TURT. Conch. Diction. p. 23. — FLEMING, Brit. Animals, p. 294. — OLIVI, Zool. Adriat. p. 37.—BRUG. Encycl. Méth. Vers, vol. i. p. 375. —CUVIER, Ann. du Mus. vol. i. p. 156, pl. 12, anatomy, &c.; vol. xvi. p. 6.—DILLW. Recent Shells, vol. i. p. 477.—COSTA, Test. Sicil. p. 76.—REEVE, Conch. Syst. vol. ii. pl. 153, f. 3.

Philine quadripartita, ASCAN. K. Vetenks. Ak. Handl. (Stockholm) 1772, p. 329, pl. 10, f. A, B.—LOVÉN, Index Moll. Scandinav. p. 9.

Bulla bulla, DA COSTA, Brit. Conch. p. 30, pl. 2, f. 3.

Lobaria quadrilobata, ABILDGAARD in MÜLLER, Zool. Danic. vol. iii. p. 330, pl. 100, f. 1 to 5, animal.—GMELIN, Syst. Nat. p. 3143, animal.

Bullæa Planciana, LAM. Syst. Anim. s. Vert. ed. 1, p. 63.—PHILIPPI, Moll. Sicil. vol. ii. p. 94, pl. 20, f. 3.

" *aperta*, LAM. Anim. s. Vert. (ed. Desh.) vol. vii. p. 664. — Brit. Marine Conch. p. 137. — BROWN, Illust. Conch. G. B. p. 57, pl. 2, f. 5, 7.—CHIAJE, Poli, Test. Sicil. vol. iii. pt. 2, p. 27, pl. 3, f. 23, 24.—PHILIPPI, Moll. Sicil. vol. i. p. 121.

Bullea " BLAINV. Man. Malacol. pl. 45, f. 2.

This abundant species is by far the largest of our wide-mouthed *Bullidæ*. It is most loosely coiled, the back being only moderately convex and the aperture so vastly open and dilated as to display the structure even to the apex, whilst the proportion of the ventral area occupied by the body, which is oblique and narrow on that side of the shell, is extremely small. The general shape is rounded subquadrate, a little narrowed above, and rather expanded and rounded below. The transparent surface is of an uniform lustrous snow-white hue, and is merely marked with the wrinkles of increase, which latter, however, are often very conspicuous. The crown is devoid of spire, and is a little indented. The outer lip is not regularly arcuated, but is much sinuated in its course; it is slightly produced above the crown (without forming an angle) posteriorly, where it advances; is most prominent rather below the middle; and recedes obliquely anteriorly. Large individuals attain to an inch and an eighth in length, and seven-eighths of an inch in breadth.

The animal is massive and white, slimy and slug-like. Seen from above it appears as if formed of four lobes, a capital disk, a mantle investing the shell, and two lateral lobes; these latter are, however, the involute wing-like processes or margins of the foot. The capital disk is irregularly pentagonal and slightly emarginate in front. The margin of the mantle posteriorly is very slightly laciniated. The membranes of the tongue are each furnished with a single series of claw-shaped lateral teeth. Lovén has observed the embryo; he found it to be furnished with a spiral shell, provided with an operculum, and to be capable of swimming by means of a ciliated veil. He also found the egg-capsules; they are gelatinous, hydrophanous, ovate, and contain very numerous eggs arranged in single file, on a very long funiculus, folded in a loose spiral.

This animal inhabits probably all parts of the British seas, but is capricious in its appearance, and seems on the whole to be more common in the south than in the north. It inhabits muddy ground at various depths, between low water-mark and thirty fathoms. We once saw vast numbers of them come in alive with the waves, on the shores of Portobello sands, near Edinburgh (E. F.).

Bullæa aperta is said to have a very wide range, and is recorded even from the southern hemisphere. It is possible, however, that more exotic species than one have been confounded under the name.

P. QUADRATA, Searles Wood.

Spirally striated, with alternately larger and smaller series of confluent impressed dots.

Plate CXIV. E. fig. 2, 3.

Bullæa quadrata, S. WOOD, Mag. Nat. Hist. new ser. vol. iii., 1839, p. 461, pl. 7, f. 1; Crag Moll. p. 179, pl. 21, f. 9, fossil.—ALDER, Cat. Moll. Northumb. and Durh. p. 26.
Bulla „ S. WOOD, Ann. and Mag. Nat. Hist. 1842, p. 460, fossil.
Philine scutulum, LOVÉN, Index Moll. Scand. p. 9, probably.

We have seen but few examples of this extremely rare shell, none of which were precisely similar in shape and sculpture to each other. It is a larger species than our other sculptured *Philines*, and is not quite so fragile. The shape, which is rounded oboval, and occasionally oblique, is sometimes a little squared ; it is subtruncated above (at times obliquely, at times even incurvately so), and subangulately rounded at the lower extremity ; the side opposite to the lip is always much bowed. It is less depressed than many of its congeners, being somewhat swollen dorsally, yet chiefly so anteriorly, as a profound retusion is visible near the upper extremity of the body ; the crown is a little indented, but does not exhibit any external volutions. Its milk-white surface is adorned by a kind of lacework, composed of very numerous and close-set scarcely raised spiral costellæ, so regularly serrated at both edges that their intervals assume the appearance of suboval, though somewhat irregularly formed, confluent impressed dots, the series of which are alternately larger and smaller, yet always narrower than the raised sculpture. This alternation gives to the costellæ, which beneath a powerful lens seem traversed by most minute spiral striulæ, and which are so very flat that the sculpture might more briefly be described as consisting of alternately larger and smaller series of confluent punctures, the appearance of being double or subdivided in the middle by a string of minute impressed dots. The wrinkles of growth are occasionally very conspicuous. The aperture is very ample, filling nearly three-fourths of the ventral area; it is of a broad and stunted pear-shape, the posterior contraction being very short, and not acute. The outer lip, which is rounded posteriorly, where it rises a little above the level of the crown, advances and becomes retuse or incurved in a line with the contraction of the body, and projects in a somewhat arcuated fashion below; at the anterior extremity the curve is so little rounded as to give an obliquely subtruncated look to the base of the aperture. The coating of enamel upon the body is rather extensive, and the incurvation of the pillar lip, which is reflected above, and somewhat indented, yet not umbilicated at the axis, is much extended, as the portion of the body which juts into the aperture is very short. One of the examples measured nearly a quarter of an inch long, and was about two lines and a third broad.

In a variety taken by Mr. M'Andrew, whose scientific dredging has thrown much light upon the boreal deep-water forms, and added not a few species to our Fauna, the contraction or retusion of surface is lower down and broader than usual, and the dots, for the most part, so run into each other, that the shell seems merely furrowed in a spiral direction by coarse jagged striæ.

The animal has not as yet been observed.

This rare shell has been taken by the Rev. G. C. Abbes and Mr. R. Howse, at Whitburn, in Northumberland, and in various depths between ten and one hundred fathoms around the Zetlands (M'Andrew and E. F.). It is an arctic and boreal species. Mr. Searles Wood discovered it fossil in the coralline crag.

P. SCABRA, O. Müller.

Oblong subcylindraceous, more or less truncated at both ends; sculpture consisting of somewhat divergent series of minute impressed dots.

Plate CXIV. E. fig. 4, 5, and (Animal) Plate V. V. fig. 1.

Bulla scabra, O. MÜLLER (not CHEMNITZ, 1788, nor GMELIN), Zool. Danicæ, vol. ii. (edition 1780, teste ENGELMANN), pl. 71, f. 11, 12.—BRUGUIERE, Encycl. Méth. Vers, vol. i. p. 376, pl. 360, f. 3.
„ *pectinata*, DILLW. Recent Shells, vol. i. p. 481. — JOHNSTON, Berwick. Club, vol. ii. p. 31.—WOOD, Index Testac. pl. 18, f. 21.—GRATEL. Sur les Bull. (and in Bul. Lin. Bordeaux), p. 22.
Bullæa granulosa, SARS, Beskriv. Bergenske Kyst, p. 73, pl. 14, f. 36.
Bulla dilatata, S. WOOD, Charlesworth, Mag. Nat. Hist. vol. iii. pl. 7, f. 3.
Bullæa catenulifera, MACGILLIV. Moll. Aberd. p. 187; copied Brit. Marine Conch. p. 251 (fig. 81, erroneously *catenata*), and BROWN, Ill. Conch. G. B. p. 131.
Philine scabra, LOVÉN, Index Moll. Scandinav. p. 9 (no descr.).
Bullæa pectinata, ALDER, Cat. Moll. Northumb. and Durh. p. 25.
Bulla (Scaphander) pectinata, A. ADAMS, Sow. Thesaur. Conch. p. 572, pl. 121, f. 51.

Two different shells having been published under the name of *Bulla scabra*, Mr. Dillwyn being compelled to change the designation of one of them, continued the name to the exotic species so called by Chemnitz, and applied the appropriate name *pectinata* to the present shell. It appears, however, that eighty plates of Müller's work were published as "Zoologiæ Danicæ" before that volume of the "Conchylien Cabinet" which contains the species in question; consequently it is the species of Chemnitz, not that of Müller, which must receive another appellation.

This beautiful shell is of an uniform snow-white, very thin, and semitransparent, and of an oblong-subcylindraceous form, that is a little dilated and obliquely subtruncated below, and terminates likewise abruptly above, though the upper edge of the body is rounded off. A most dense array of continuous impressed dots, arranged in spiral rows, though the series diverge a little at the extremities, pervades the external surface, and pectinates the margin of the front extremity of the aperture in perfect individuals. A whorl or two, separated by a rather shallow, but broadly canaliculated, suture, is visible upon the crown of the shell, above which latter the very blunt apex barely protrudes, the spire not being elevated. The surface is decidedly convex, but the shell is much compressed, the depth being very inferior to the breadth. The aperture is very ample, and fills from three-fifths to two-thirds of the ventral area; it is somewhat ham-shaped, narrow above, though quickly dilating anteriorly, and so very bluntly rounded below, where both lips recede considerably, that the broad extremity seems almost truncated. The outer lip is not much arcuated, and bends to the right; it is almost at a level with the apex at its junction with the body, and advances and curls inwards a little above; the edge itself is convex. The columella is sliced away, as it were, so as to display the internal gyration. The pillar lip is moderately incurved, and its edge seems a little raised and very slightly bent back; it is not, however, distinctly reflected, nor is there any vestige of an umbilicus. The shell measures a quarter of an inch in length, and rather more than the eighth of an inch in breadth.

The animal is rather more elongated in shape than its congeners. It is entirely white, usually slightly tinged with yellowish or tawny. The margin of the mantle posteriorly is laciniated. The lateral lobes, or foot wings, are large. Lovén states that the sides of the tongue are armed, besides the row of large laterals, with a single series, on each side, of minute supplementary denticles.

This pretty shell, which is much more common in the south than in the north, has a range in depth of from five to fifty fathoms. It has been taken in Devon, and on the west of Ireland by Mr. Barlee, on the Northumberland coast by Mr. Alder, and at Scarborough by Mr. Bean. Among the Hebrides and Zetlands it is not uncommon (M'Andrew and E. F.). Mr. W. Thompson records it from localities on both sides of Ireland.

It ranges throughout the boreal seas.

P. catena, Montagu.

Minute, subovate; sculpture consisting of spiral series of rings.

Plate CXIV. E. fig. 6, 7, and (Animal) Plate U. U. fig. 6.

Bulla catena, Mont. Test. Brit. p. 215, pl. 7, f. 7. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 122. — Turt. Conch. Diction. p. 24. — Johnston, Berwick. Club, vol. ii. p. 31. — Dillw. Recent Shells, vol. i. p. 478.—Wood, Index Testaceolog. pl. 18, f. 15. —Gratel. Sur les Bull. (and Bul. Lin. Bordeaux), p. 23.

„ *punctata*, Fleming, Brit. Animals, p. 294.

Bullæa catena, Clark, Zool. Journ. vol. iii. p. 337.—Macgilliv. Moll. Aberd. p. 187.—Brown, Illust. Conch. G. B. p. 57, pl. 19, f. 33, 34.

„ *angustata* (Bivon), Philippi, Moll. Sicil. vol. i. p. 121, pl. 7, f. 17.

„ *catenata*, Brit. Marine Conch. p. 138 (not figure).

Bullæa punctata, PHILIPPI, Moll. Sicil. vol. ii. p. 95.
Bulla (*Philine*) *catena*, A. ADAMS, Sow. Thesaur. Conch. vol. ii. p. 601, pl. 125 f. 163.

The shell is very small, barely composed of two coils, extremely thin, of an uniform snow-white, and of a depressed obliquely subovate figure, that is rounded at both extremities, yet less so above, where, though narrower, it is not distinctly retuse nor particularly contracted, than below, where it becomes more ventricose and a little dilated. The surface is adorned throughout by very numerous chain-like somewhat divergently spiral raised lines, the continuous links of which are sometimes round, sometimes oval, sometimes still more transversely produced; these series are very closely disposed, but are not so broad as their intervals. The crown is neither umbilicated nor distinctly raised, but is obtuse, and exhibits a single volution; the sutural line is rather deep. The aperture is very ample, filling nearly three quarters of the ventral area; it is of an obovate-subpyriform shape, being only narrow for a brief space above, and much dilated below, where its extremity is broadly but not bluntly rounded. The outer lip, which is almost even with the crown above, is only moderately arched, being chiefly prominent towards the anterior extremity. The pillar lip is broadly incurved, and neither reflected nor flanked by an umbilical depression. Our largest examples only measure a fifth of an inch in length, and an eighth of an inch in breadth.*

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* Our Mediterranean specimens are somewhat larger, and have a slight recurvation of the pillar, so as to form an indistinct false umbilicus; they approach nearer to the *sculpta* of Searles Wood (Crag Moll. p. 120, pl. 21, f. 10) than do our English examples. Montagu's variety of *Bulla catena* (Test. Brit. p. 215, copied in Turt. Conch. Diction. p. 24, and Fleming, Brit. Anim. p. 294) has not been met with by us. He thus describes it. "A variety with a more transpa-

The animal resembles that of *scabra* in shape, but has the posterior margin of the mantle more entire. It is of a yellow or yellowish white hue, with tawny dots.

This species is sparingly distributed all through the British seas, and, though local, is yet so general, that an enumeration of localities would be superfluous. It ranges from low water-mark to as deep as forty fathoms.

P. PUNCTATA, Clark.

Minute; sculpture consisting of spiral series of interrupted compressed dots.

Plate CXIV. E. fig. 8, 9, and (Animal) Plate U. U. fig. 6.

Bullæa punctata, CLARK (not MÖLLER), Zool. Journ. vol. iii. p. 339. — TURT. Mag. Nat. Hist. vol. vii. p. 353.—MACGILLIV. Moll. Aberd. p. 187.—Brit. Marine Conch. p. 137.—BROWN, Illust. Conch. G. B. p. 58.

Bulla (*Philine*) *punctata*, A. ADAMS, Sow. Thesaur. Conch. vol. ii. p. 600, pl. 125, f. 161.

In the fifth volume of the Linnean Transactions (pl. 1, f. 6, 7, 8), the older Adams has rudely delineated, under the name of *Bulla punctata*, a shell, which bears no more likeness to the present species than to any other sculptured member of the genus.

The species courteously attributed to him by Clark, is still more minute than the last, to which, except in sculpture, it bears so much resemblance, that we shall content ourselves with describing the points of difference. It is less depressed, and of a shorter and more rounded shape; towards the lip there is a slight posterior retusion. The surface is adorned throughout with very numerous and

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rent zone round it, taking in eight or ten of the *catenæ*, which are more strongly defined; the rest of the shell appears as it were frosted, and not so glossy, possessing a *subumbilicus*, and the outer margin of the aperture close to the body, is winged or reflected a little, forming a depression or sulcus on that part.

rather densely disposed spiral series of impressed dots, which seem like the depressions which proceed from a decussation of raised striæ. The aperture is not quite so capacious as in *catena*, since the body occupies a rather larger portion of the ventral area; it is not either so contracted above, where the outer lip, which advances very decidedly posteriorly, and is much arcuated below, juts out and curves up a little, thus forming a slightly angular lobe. The course of the inner lip is not so sinuous as in the preceding shell, the incurvation of the pillar lip, which exhibits a slight disposition to reflection above, being less pronounced. In the majority of specimens the length is only a single line, but it attains sometimes to a tenth of an inch in length, and a third less in breadth.

The animal of *Bullæa punctata* has been observed by Mr. Alder, from whose beautiful drawings our figure is taken. It is of a darker colour than its congeners, being tinged and speckled with reddish brown on a yellowish ground. Its capital disk seems different in shape, and much shorter and broader than that of *catena*, and the margin of the mantle is not laciniated.

Torbay and Exmouth (Clark); Swansea (Jeffreys); rather common in drift-sand from Barrow Island (S. H.); Scarborough (Bean); Aberdeen (Macgillivray); off Trouphead, Aberdeenshire, in sixty fathoms (Thomas); Miltown Malby (Harvey); Kilkee in Clare, and Bundoran in Donegal, where it was taken by Mrs. Hancock (W. Thompson).

P. PRUINOSA, Clark.

Surface shagreened like hoar-frost, being decussated by most crowded longitudinal and rather close-set spiral raised wrinkles; occasionally with a coloured zone.

Plate CXIV. F. fig. 1, 2.

Bullæa pruinosa, CLARK, Zool. Journ. vol. iii. p. 339. — Brit. Marine Conch. p. 137.
Philine „ LOVÉN, Index Moll. Scandinav. p. 9, animal.
Bulla „ JEFFREYS, Ann. Nat. Hist. vol. xix. p. 310.
„ (*Philine*) *pruinosa*, A. ADAMS, Sow. Thesaur. Conch. vol. ii. p. 560, pl. 125, f. 162.

Colour is of rare occurrence in this genus, yet in this small and delicate species a somewhat broad spiral band of yellowish or chestnut-brown occasionally presents itself upon the body, and relieves the otherwise uniform surface of frosted snow white. The shape is subglobose, but decidedly longer than it is broad; it is very convex dorsally, but is a little pinched in near the posterior end; its crown is somewhat rounded, and indented by a tolerably large but shallow umbilicus. The hoar-frost appearance of its entire exterior results from its decussation by raised longitudinal and spiral wrinkles, the former of which are rather the more conspicuous; both are so densely disposed that the interstitial punctures, which are usually rather longer than broad, are extremely minute. The aperture is capacious, filling in the adult three-fifths, in the young two-thirds at least, of the ventral area; it is rather broadly ficiform, being abruptly contracted by the swell of the body above, well rounded and expanded anteriorly. The outer lip is greatly arched, and is scarcely, if at all, produced posteriorly above the crown. The incurved pillar lip is decidedly produced, and is raised a little at the edge, where it exhibits some slight disposition to be reflected; hence the area behind it is somewhat hollowed; occasionally, too, there is an indistinct subumbilicus. Fine specimens occasionally attain to the third of an inch in length, and a quarter of an inch in breadth.*

The animal of this species has been carefully examined and described by its discoverer, and an account of it has also been given by Lovén. It is white, speckled with flaky spots. The capital disk is quadrate-ovate and emarginate in front; the margin of the lateral lobes or reflexed sides of the foot are laciniated; the posterior margin of the mantle is incised.

It was originally found by Mr. Clark at Exmouth. Mr. Alder has taken it on the Northumberland coast, and Dr. Fleming in the Frith of Forth. Mr. Barlee finds it in Loch Fyne and elsewhere in the Hebrides, and on the west coast of Ireland. We have taken it in as deep as seventy fathoms water on muddy ground in the Hebrides (M'Andrew and E. F.). It occurs in Zetland. Lovén records it as an inhabitant of the Norwegian seas.

The fry, or broken examples, of two species of *Bullidæ*, have been raised to the rank of species by the older Adams, whose wretched attempts at delineation, and still more imperfect style of description, have rendered their determination conjectural. The first of them is supposed by Mr. Jeffreys (who has bestowed much pains on the almost hopeless task of identifying the obscure species of that writer) to be the fry of *aperta*, the second to be drawn from a (broken) very young *hyalina*.

Bulla denticulata, ADAMS, Trans. Linn. Soc. vol. v. pl. 1, f. 3, 4, 5, from which MONT. Test. Brit. p. 217; MATON and RACK. Trans. Linn. Soc. vol. viii. p. 122; TURT. Conch. Diction. p. 27; FLEMING, Brit. Animals, p. 294. — BROWN, Ill. Conch. G. B. p. 57, pl. 19, f. 25, 26.

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* The drawing of the *B. ventrosa* of Searles Wood (Crag Moll. p. 182, pl. 21, f. 11) looks very like an adult *pruinosa*; but the outer lip of the recent species is not "deeply cleft or sinuated, and disconnected up to the vertex."

Bulla emarginata, ADAMS, Trans. Linn. Soc. vol. v. pl. 1, f. 9, 10, 11, from which MONT. Test. Brit. p. 216; MATON and RACK. Trans. Linn. Soc. vol. viii. p. 122; TURT. Conch. Diction. p. 27; FLEMING, Brit. Anim. p. 294; BROWN, Ill. Conch. G. B. p. 57, pl. 19, f. 21, 22.

The *Utriculus lima* of Brown (Ill. Conch. G. B. p. 58, pl. 19, f. 39, 40) is a fossil species.

NOTE.—Through inadvertence we have overlooked in this account of the British *Bullidæ*, Mr. Clark's interesting paper in the "Annals of Natural History" for August, 1850, in which there are very full accounts of the animals of *Bulla hydatis*, *Cylichna cylindracea*, and *Cylichna truncata*. It is there shown that *Cylichna*, contrary to the statement put forward at page 507, has a gizzard of testaceous plates, a fact of which we have had further reason to convince ourselves by the examination of specimens kindly forwarded by Mr. Clark. (E. F.)

APLYSIADÆ.

This family includes a number of Molluscs, some provided with shells, and some wanting them, many of which are remarkable for their size and singular aspect. The shell, when present, is internal, and in a manner rudimentary. It is contained in a dorsal opercular fold protecting the gills. The head of the animal contrasts with that of the members of the last tribe, in being distinct, and constantly furnished with tentacula and eyes. All the species of this tribe are hermaphrodites.

APLYSIA. Linnæus.

Shell a variously shaped, usually ovate, corneous internal plate, with indications of a rudimentary spire. No operculum.

Animal ovate, convex; its head pedicled, furnished with four auriculated tentacula: at the anterior and lateral bases of the upper two are the small sessile eyes. Shell imbedded in an opercular lobe, placed centrally in the back, and protecting the branchial plume, which is not protruded. Mantle with large lateral lobes folding over each other, and protecting the operculum, but capable of being used for swimming. Foot oblong. Mouth subproboscidiform, armed with corneous jaws; tongue armed with a single row of hamated central teeth, and numerous uncinated laterals. Gizzard studded with cartilaginous plates. Reproductive orifices beneath the tentacula on right side. Vent at the extremity of a tube.

Few molluscs have had greater popular fame, or a worse character than the *Aplysiæ*. From very ancient times they have been regarded with horror aud suspicion, and many writers on Natural History, conversant with them only through the silly stories of ignorant fishermen, have combined, in ancient and modern times, to hold them up to censure for their poisonous qualities. To touch them, according to Europeans, was sufficient to generate disease in the fool-hardy experimenter; whilst Asiatics, reversing the consequences, maintained that they met with instantaneous death when handled by man. Physicians wrote treatises on the effects of their poison, and discussed the remedies best adapted to neutralize it. Conspirators brewed nauseous beverages from their slimy bodies, and administered the potion, confident of its deadly powers. Every nation in the world, on whose shores the poor sea-hares crawled, accorded to them the attributes of ferocity and danger. Yet, strange to say, there does not appear to have been the slightest foundation for a belief in their crimes. The *Aplysia* is a perfectly harmless, gentle, timid, and, if observed in its native element, beautiful animal. Its odour is sometimes, it is true, not over-pleasant, and when irritated, it ejects a fluid, the vivid purple hue of which may have excited alarm. Its shape, in which it resembles more than most molluscs the body of some little quadruped, attracted the attention of the curious; but why it should have excited their fears, and filled with terror the muscular hearts of sturdy fishermen, is a problem to be solved only when the predisposing causes of groundless superstitions shall have been sifted and traced to their minutest roots.

The sea-hares live among sea-weeds in the Laminarian zone, rarely straying out of that region. They feed on both vegetable and animal matter, as was observed by Cuvier, though, by some mistake, his authority has frequently been quoted for the statement that they are exclusively vegetable feeders. They breed in spring, and lay their eggs in slimy *nidi* among sea-weeds. At their breeding season they often congregate in vast numbers.

The anatomy of the *Aplysiæ* forms the subject of one of Cuvier's most admirable memoirs, and some new and most interesting inquiries into their circulation have been published by Milne-Edwards in his account of zoological researches in Sicily.

Three species of *Aplysia* are usually enumerated as inhabiting the British seas. We can obtain no authentic evidence of more than one having been observed, for the so-called *depilans* is not that species, but a variety of the following, of which *nexa* proves to be the young animal.

A. HYBRIDA, Sowerby.

Plate CXIV. F. fig. 4, and (Animal) Plate Y. Y. fig. 1.

Laplysia depilans, PENNANT, Brit. Zool. ed. 4, vol. iv. p. 42, pl. 21, f. 21.
Aplysia hybrida, SOWERBY, Brit. Misc. pl. 53 (1806).
,, *mustelina*, H. DAVIES in Pennant Brit. Zool. ed. 1812, vol iv. p. 79, pl. 22.—JOHNSTON, Trans. Berwick. Nat. Club, vol. ii. p. 29.
,, *depilans* and *punctata*, FLEMING, Brit. Anim. p. 290.
,, *nexa* (YOUNG), THOMPSON, Ann. Nat. Hist. vol. xv. p. 313, pl. 19, f. 8.
,, *depilans*, Brit. Marine Conch. p. 143, f. 80.
,, *punctata*, ALDER, Cat. Moll. Northumb. p. 24.

In our synonymy of the only British species of *Aplysia* at present known with any certainty, we have abstained from referring to the figures and descriptions of continental authors, since none exactly agree with ours, though there can be scarcely a question that under the *punctata* of Cuvier the British one is included. Since, however, there is no doubt respecting its distinctness from the animal of Bohadsch, which was the original *depilans*, a species which we have ourselves examined in the Mediterranean, we are obliged to fall back on the name *hybrida*, given by the elder Sowerby to the *Aplysia* from Cornwall, figured by him in the British Miscellany, but so badly, owing to the condition of the specimen, that a person not acquainted with the varying appearance of these curious creatures, might fairly hold it to be a distinct species. None of the figures in Rang's monograph of the *Aplysiæ* is sufficiently like ours to warrant a reference, unless we should quote the *rosea* of Rathke, which undoubtedly represents the young of our species in its condition known as *nexa*.

The shield is transparent, fragile, of a dark fulvous horn colour, and of a somewhat elastic corneous texture; the surface is shining and nearly smooth, yet some obscure radiating lines, or slight indentations, and some obscure wrinkles of increase, are usually apparent. The upper central dorsal area is convexly swollen, the slope from thence downwards is gradual; from thence to the sides rather quicker. The general shape ranges from oval-acute to oboval-acute, the lower and rather the longer portion being semi-elliptical, whilst the upper end is obliquely subrectangular, and the beak or apex, as it slants, bends a little inwards, but does not exhibit the slightest vestige of any spiral coil. Of the two edges which form the angle, the shorter is somewhat incurved, and has but little declination; the other is more convex, and almost forms a continuous curve with the lower arch. The whole of the internal area is manifest. Occasionally the sides are less arched, in which event the lower half of the shield has a somewhat squarish aspect.

A rather large specimen measured thirteen lines long, and ten lines and a half broad.

The general hue of the animal is a yellowish grey or olive, minutely speckled with brown, variously spotted with white, the spots often surrounded with darker rings, and frequently compound, consisting of a central spot, surrounded by a circle of smaller ones. The mantle lobes, which are large and unequal, are pale at the edges, as are also the tentacula. The latter have dusky tips. The sides are often tinged with warm purplish brown. An unspotted variety occurs; this is the *mustelina* of Davies and *depilans* of many catalogues. The general shape varies much according to the animal's position. When creeping it is elongated, when at rest nearly globular. The back is always very convex. The tentacles are cylindrical and tapering, grooved beneath; the eyes are small and black, and placed at their anterior and lateral bases. The clear-brown, very convex shield, is seen through the skin, but its place is not marked by the radiating silvery lines described by Philippi as occurring in *punctata*.

A specimen which measured two inches long when at rest, was double that length when creeping. When alarmed it gives out a rich purple fluid, slightly odorous.

Dr. Johnston notices an individual which had the lobes bordered with bright blue.

Young specimens are more elongated, and of a dark purple colour. This animal occurs at intervals all round our shores, and is very plentiful in many places both in the north and south. It lives among sea-weeds and Zostera, between low water-mark and five or six fathoms. We have found it equally abundant at Guernsey and S. Devon (S. H.); and Orkney (E. F.).

PLEUROBRANCHIDÆ.

This family forms a connecting link between the last two and the nudibranchous groups. The structure of the head and tentacula reminds us of *Aplysia*, from which type and its immediate allies it is distinguished, among other features, by the circumstance that the dorsal shield is not a covering or lid for the branchial plume, but a protecting plate for the viscera of the body.

PLEUROBRANCHUS. Cuvier.

Shell an internal membranaceous, oblong or suborbicular, expanded shield, with a subspiral apex, lodged in the dorsal region of the mantle.

Animal oblong or suborbicular, fleshy. Head with two grooved tentacula, the eyes at their external bases; a broad tentaculiform buccal veil; mouth provided with corneous jaws, and an armed lingual ribband. Branchial plume single, free towards its extremity, placed on the right side between the mantle and foot, the genital organs near its origin, the vent not far from its termination. Foot ample, separated from the mantle by a deep groove.

The animals of this genus are but poorly represented in the British seas. On the shores of warmer climates they become more plentiful, and are remarkable for the delicate, and often vivid, hues of their bodies. Whoever observes them should make a coloured drawing of their appearance when alive.

P. MEMBRANACEUS, Montagu.

Large, ovate, flat, perfectly membranaceous; a mere vestige of a spiral apex.

Plate CXIV. F. fig. 5, and (Animal) Plate X. X. fig. 3.

Lamellaria membranacea, MONT. Trans. Linn. Soc. (1811), vol. xi. p. 184, pl. 12, f. 3, 4.—GRAY, Encyclop. Metropolitana, Moll. pl. 3, f. 15.
Bulla „ TURT. Conch. Diction. p. 25.
Pleurobranchus membranaceus, FLEMING, Brit. Animals, p. 291.—Brit. Marine Conch. p. 133, f. 76.—BROWN, Illust. Conch. G. B. p. 62, pl. 2, f. 9. — SOWERBY, Genera Shells, Pleurobranchus. — SOWERBY (Jun.), Man. Conch. f. 232. — REEVE, Conch. Syst. vol. ii. pl. 154.

Although the shield offers but few characters for description, no one who has ever looked upon a specimen will subsequently fail to recognise it. It is extremely thin, being indeed almost wholly membranaceous; and is much spread and very depressed, being merely convex. The surface of the shell, which is more or less strongly tinged with flesh-colour, is very shining, and has a subnacreous lustre that at times passes into the metallic; it is somewhat roughened by elevated wrinkles of increase. The shape in the adult examples is nearly ovate, being narrowed, but not peaked above, and broadly, yet bluntly, rounded below. A mere vestige of a spiral apex is just perceptible, and the situation of this rudimentary spire is less lateral than in *plumula*. The entire internal area is visible, as the curl or bending over of the body is very trifling, and is confined to the extreme posterior portion of the aperture: the pillar lip is simple and not reflected. An average-sized individual that measured nineteen lines long, was thirteen lines in breadth. When young the form approaches much nearer to the shape of the preceding species, but the shell is devoid of any similar radiating indentation of surface.

The animal grows to a considerable size. It is of a general oval shape. The tentacles and oral veil are pale, the latter produced at the angles. The dorsal disk is papillated and of a rusty brown hue, but varies greatly in intensity of colour. The branchial plume is yellowish and pale. The margins of the foot are expanded and pale, except at the edge, where they are bordered with tawny.

This fine species has been taken at low water at various localities on the Devonshire coast, where it was first noticed by Montagu. Mr. Barlee has found it at Arran and Birterbuy in Ireland, and Mr. Humphreys at Cork. Our figures of it and of its congener are taken from some admirable original drawings by our eminent and accomplished friend Mr. Alder.

P. PLUMULA, Montagu.

Small, testaceous, narrow; apex coiled.

Plate CXIV. F. fig. 6, 7, and (Animal), Plate X. X. fig. 1.

Bulla plumula, MONT. Test. Brit. p. 214, pl. 15, f. 9; vign. 2, f. 5, animal.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 123.—TURT. Conch. Diction. p. 25.—DILLW. Recent Shells, vol. i. p. 478.—WOOD, Index Testaceolog. pl. 18, f. 16.—GRATEL. Sur les Bull. (and in Bull. Lin. Bordeaux), p. 10.

Berthella porosa, BLAINV. Man. Malac. pl. 43, f. 1.

Pleurobranchus plumula, FLEMING, Brit. Animals, p. 291.—JOHNSTON, Mag. Nat. Hist. vol. vii. p. 348, f. 46; Berwick. Club, vol. ii. p. 27, with animal.—Brit. Marine Conch. p. 132.—BROWN, Illust. Conch. G. B. p. 62, pl. 2, f. 14, 15.

The shield of this rare species is much smaller than in *membranacea*, and although thin and semitransparent, is very much stronger, the substance being shelly. It is of a lighter or darker glossy horn colour, generally tinged with yellow, especially on the polished interior, and usually displays rather conspicuous wrinkles of increase. The shape is oblong, slightly broader and somewhat squared above (though the angles are rounded off), and rather bluntly rounded below; the sides are subparallel, but the outer lip is much more arcuated above, and becomes retusely indented below the middle, after which it bends convexly to the anterior extremity. Two or three impressed lines obliquely radiate, upon the exterior, from the outer corner of the lower extremity towards the crown, which latter exhibits a perfectly distinct, though minute, spiral coil. When the aperture (which displays the whole interior, there being merely an extremely narrow lateral convolution above) is placed on a flat surface, the shell rests solely on its upper and lower extremities (as in *Parmophorus*, of which genus it forcibly reminds us), leaving a slight but extended gape in the middle: hence, although the shield is depressed, it appears rounded on the back. The pillar lip is very narrow, but is decidedly reflected. Our largest specimen, which is about twice as long as it is broad, measures about three-fifths of an inch from the top of the outer lip, which projects slightly above the crown, to the opposite extremity.

The animal is, when at rest, of a suborbicular shape, when creeping it is oblong. The dorsal disk is convex, smooth, yellowish-white, and speckled with reticulating whitish dots: the shield shining of an orange colour through the skin, which is strengthened by spiculæ. The tentacula are rather long, their bases, with the minute eyes, are hidden beneath the margin of the mantle. The foot extends beyond the dorsal disk, and both have a slightly sinuous margin. The angles of the oral veil are acutely prolonged. It lives between tide marks.

Although seldom taken, it appears to have a wide range. Exmouth (Clark); Guernsey; Salcombe bay (Barlee); Milford Haven (Lyons); Isle of Man; Sound of Skye (E. F.); Scarborough (Bean); Coast of Northumberland (Johnston); Malbay, on the west coast of Ireland (Harvey).

DORIDIDÆ.

This and the two following families constitute the order Nudibranchiata of Cuvier. The Mollusca they include are entirely destitute of shells, except when in the embryo state. Their branchial organs are constantly external, and are variously arranged along the margins or on the dorsal surface of the body. The individuals are hermaphrodite. In the Dorididæ the branchial plumes are placed on the middle of the back, in immediate proximity with the vent.

Since the chief intention of this history is to describe and figure fully the testaceous molluscs of the British islands, more especially the marine tribes, at the same time that we give a summary of the species unprovided with shells, our account of these nudibranchous orders must necessarily be extremely brief. To treat of them in detail would be to extend our volumes far beyond the proposed bounds. Fortunately, there is no necessity for doing so, since one of the most beautiful and perfectly executed works of which zoological science can boast, is devoted to the British Nudibranchiata. We allude to the Monograph by Messrs. Alder and Hancock, published by the Ray Society. The figures and descriptions (the language of which we have closely followed) contained in that treatise are beyond all praise. To them we must refer those of our readers who desire to master this interesting branch of study.

Our brief account of the genera and species, and our illustrations of an example (in most cases) of each group will serve as a working manual and synopsis of the present condition of the subject.

DORIS. Linnæus.

Body elliptical, depressed, rarely convex, covered by an ample mantle, the surface of which is in most species tuberculated, and the margins extend over the head and the sides of the foot; variously coloured. Head hidden by the mantle, furnished with an oral veil, which is sometimes produced into two labial tentacula. Dorsal tentacula two, subclavate, laminated, retractile within a cavity. Branchiæ plumose, surrounding the vent, which is placed medially on the hinder portion of the back. Genital orifice at the right side.

The species of this genus inhabit for the most part the littoral and laminarian zones, and appear to be carnivorous. They are found in all parts of the world, and are often of large size and exquisite beauty. A full account of their anatomy and development is contained in the fifth part of the Monograph by Alder and Hancock.

1. D. tuberculata, Cuvier.

Doris tuberculata, Cuvier, Mem. Moll. v. 23, pl. 2, f. 5.—Johnston, Ann. Nat. Hist. vol. i. p. 50, pl. ii. fig. 1-3.

„ *argo*, Pennant, Brit. Zool. vol. iv. p. 82, pl. 24.—Fleming, Brit. Ann. p. 282.

Body (three inches and more in length) yellowish grey, with brownish and pink cloudings, ovate, depressed; cloak ample, spinulose, closely covered with minute round tubercles. Dorsal tentacles rather short, conical, yellowish above, white towards their bases. Branchial plumes eight, large, tripinnate, bluish, with white and yellow spots, surrounding the prominent tubular vent.

Common on the east coast of Scotland and the north-east of England; not so frequent on the west, living between tide-marks. It ranges throughout the British seas, from Devon to Zetland.

Doris mera of Alder and Hancock is now considered by its describers to be a variety of this species.

2. D. FLAMMEA, Alder and Hancock.

Doris flammea, ALDER and HANCOCK, Monog. part 1, fam. 1, pl. 4.—Ann. Nat. Hist. vol. xiv. p. 330.
,, *argus*, FORBES, Ann. Nat. Hist. vol. v. p. 105.

Body of a bright orange scarlet, occasionally blotched with purple, ovate, rounded at both ends, rather depressed. Cloak ample, covered with smallish unequal tubercles. Dorsal tentacles, large, tapering, orange. Branchial plumes nine, tripinnate, scarlet, not much spreading, retractile within a single cavity.

Length one inch, breadth half an inch.

On *Pecten opercularis* in shallow water, Rothsay Bay (Alder). In twenty-five fathoms off Ballaugh, Isle of Man (E. F.).

3. D. JOHNSTONI, Alder and Hancock.

Doris Johnstoni, ALDER and HANCOCK, Monog. part 1, fam. 1, pl. 5.
,, *obvelata*, JOHNSTON, Annals Nat. Hist. vol. i. p. 52. (Not of Müller.)

Body ovate, convex dorsally, depressed towards the sides, yellowish white or buff coloured. Cloak ample, closely covered with very minute equal tubercles, blotched with pale brown. Dorsal tentacles short and broad, speckled with brown. Oral tentacles linear. Branchial plumes fifteen, tripinnate, arranged as a cup around the brown tubular vent, retractile within a single cavity.

Length one inch and a half or two inches.

It lives near low water-mark, and has been taken on the eastern and southern coasts of England, in the Irish Sea, and in the Clyde district.

4. D. COCCINEA, Forbes.

Plate Y, Y, fig. 2.

Doris coccinea, FORBES, Rep. Brit. Assoc. Cork, 1843, p. 133.
„ „ ALDER and HANCOCK, Monog. part 4, fam. 1, pl. 7.

Body of a bright scarlet, with minute black specks, elliptic oblong, a little depressed. Cloak thickly covered with very minute equal tubercles. Dorsal tentacles short, stout, clavate, yellowish. Oral tentacles long, linear and tapering. Branchial plumes small, ten, forming a complete circle, retractile within a single cavity. Length half an inch.

On the coast of Cornwall, where it was first observed by Mr. R. A. Couch (Alder). It ranges to the Ægean (E. F.).

5. D. PLANATA, Alder and Hancock.

Doris planata, ALDER and HANCOCK, Ann. Nat. Hist. vol. xviii. p. 292.— Monograph, part 3, fam. 1, pl. 1.

Body very much depressed, elliptic, reddish brown, speckled and blotched with yellow and purplish brown. Cloak ample, covered with unequal tubercles. Dorsal tentacles subclavate, yellowish. Oral tentacles long, linear. Branchial plumes seven, very small, fawn-coloured, with dark specks, retractile within a single cavity.

Length nearly an inch. The aspect of this species reminds us of a *Planaria*. It was discovered by Mr. Alder in Lamlash bay, Arran.

6. D. REPANDA, Alder and Hancock.

Doris repanda, ALDER and HANCOCK, Annals. Nat. Hist. vol. ix. p. 32. — Monograph, part 3, fam. 1, pl. 6.

Body depressed, elliptic, of a waxy white hue. Cloak ample, covered with small, distant, inconspicuous, white tubercles, a row of yellowish-white spots down each side. Dorsal tentacles rather long, white. Oral tentacles flat, broad, forming a veil. Branchial plumes small, five, white, retractile within a single cavity.

Length above an inch. It has been taken on the east coast of England, and the west coasts of Scotland and Ireland.

7. D. ULIDIANA, Thompson.

Doris ulidiana, THOMPSON, Ann. Nat. Hist. vol. xv. p. 312.

Body depressed, ovate oblong, pale yellow. Cloak not ample, rough with spicula, and covered with large, unequal, obtuse tubercles, the spicula collected in bundles, and radiating at their base. Dorsal tentacles long and whitish, without sheaths, the edges of the apertures plain. Branchial plumes eleven, pinnated, white. Foot rather broad. Veil above the mouth semicircular.

Length half an inch or more. Upon oysters on the north-east coast of Ireland (Thompson).

8. D. ASPERA, Alder and Hancock.

Doris aspera, ALDER and HANCOCK, Annals of Nat. Hist. vol. ix. p. 32.

Body (four-tenths of an inch in length) depressed, white or yellowish, semitransparent. Cloak filled with spicula, running in all directions, covered with large obtuse tubercles, interspersed with a few smaller ones, not crowded; firm and rough to the touch. Dorsal tentacula long, slender, white or yellowish. Branchiæ consisting of nine small, simply pinnate, transparent white plumes. Foot, when in motion, extending beyond the cloak behind.

Common among the rocks at Tynemouth, Cullercoats, and Whitby (A. and H.).

9. D. DIAPHANA, Alder and Hancock.

Doris diaphana, ALDER and HANCOCK, in Annals Nat. Hist. vol. xvi. p. 313; and Monograph, part 2, fam. 1, pl. 10.

Body (half an inch in length) oblong, rounded at the extremities, rather convex, of a general pale yellowish-white, very transparent. Cloak not ample, covered with large clavate, rather distant, nearly equal tubercles, becoming more numerous towards the margin. Dorsal tentacles linear, yellowish, inserted in smooth-edged sheathless cavities. Oral veil ample, semicircular. Branchial plumes eleven, simply pinnate, placed round a tuberculated area, and partially retractile.

It was taken by its describers at low water, Torbay.

10. D. BILAMELLATA, Linnæus.

Doris bilamellata, LINNÆUS Syst. Nat.—JOHNSTON, Ann. Nat. Hist. vol. i. p. 53.

„ *fusca*, MULLER, Zool. Dan. t. 47, f. 6-9.

Doris verrucosa, Pennant, Brit. Zool. vol. iv. p. 82, pl. 23, fig. 2. — Fleming, Brit. Ann. p. 282.

Body (an inch or more in length) grey, clouded and speckled with brown, sometimes white, oval, depressed. Cloak not ample, rough, with nearly equal small tubercles. Dorsal tentacula conical, not very large. Branchial plumes twelve or more, simply pinnate, rather short, retractile within a single cavity.

Common on many parts of both east and west coast; especially abundant at low water in the Frith of Forth. *Doris affinis* of Thomson is probably a variety.

11. Doris oblonga, Alder and Hancock.

Annals of Nat. Hist. vol. xvi. p. 314, and Monograph, part 5, fam. 1, pl. 16, figs. 4, 5.

Body oblongovate, tapering behind, convex. Cloak straw-coloured, freckled with brown, densely spiculose, covered with pointed papillæ. Dorsal tentacles yellowish, without sheaths, rather thick. Oral veil semicircular. Branchial plumes seven, pinnate, non-retractile, yellowish-white.

Half an inch in length.

In deepest water off Berry Head, Torquay (Alder).

12. Doris depressa, Alder and Hancock.

Doris depressa, Alder and Hancock, Ann. Nat. Hist. vol. ix. p. 32.
„ „ Monograph, part 5, fam. 1, pl. 12, figs. 1-8.

Body thin, transparent, very much depressed, elliptical. Cloak yellowish, speckled with reddish or brown, covered with soft, linear, loosely set papillæ, and stiffened with large spicula, symmetrically arranged. Dorsal tentacles linear, slender, yellowish, oral veil semicircular. Branchial plumes ten or eleven, simply pinnate, small, whitish, rather distant from the vent, retractile within separate cavities. Eyes conspicuous in the adult.

Under three-eighths of an inch in length.

Northumberland, Yorkshire, and Devon, under stones near low water-mark (Alder); Sound of Skye (M'Andrew and E. F.).

13. DORIS INCONSPICUA, Alder and Hancock.

ALDER and HANCOCK, Monog. part 5, fam. 1, pl. 12, figs. 9-16.

Body elliptic, depressed. Cloak dull white, speckled with minute brown spots, covered with numerous nearly equal, spiculose tubercles. Dorsal tentacles large, stout, nearly linear. Oral veil slightly undulated, broad. Branchial plumes ten, small and obtuse, dull white, forming an incomplete circle at a little distance around the anus.

Half an inch in length.

On *Cellipora pumicosa* from deep water, Northumberland (Howse).

14. D. PUSILLA, Alder and Hancock.

ALDER and HANCOCK in Annals Nat. Hist. vol. xvi. p. 313, and Monograph, part 2, fam. 1, pl. 13.

Body (only three lines in length) ovate, much depressed; cloak not ample, yellowish, with thickly set brown spots, and covered with conical, obtuse tubercles, which are not spiculose. Dorsal tentacles conical, long, and slender, white, and sheathless. Oral veil, semicircular, broad, and sinuous. Branchial plumes nine, short, broad, simply-pinnate, white, surrounding a tuberculated space.

This species, and its near ally *depressa*, are remarkable for depositing their spawn in a multi-spiral thread, instead of a flattened ribband of few coils, as is usual with their congeners.

Doris pusilla was taken by its describers, among rocks, during a low spring tide, at Torquay in Devonshire.

15. D. sparsa, Alder and Hancock.

Alder and Hancock in Annals Nat. Hist. vol. 18, p. 293, and Monograph, part 4, fam. 1, pl. 14.

Body (a quarter of an inch long) much depressed, ovate, rounded at each end. Cloak extending very little beyond the foot, yellowish with distant ferruginous spots, and covered with small, obtuse, flattened, rather distant, unequal spiculose tubercles, which decrease in size towards the margin. Dorsal tentacles rather conical, whitish, issuing from cavities with tubercular edges. Oral veil semicircular, expanded. Branchial plumes nine, very small, simply pinnate, colourless, arranged around the vent in an incomplete circle, leaving a small tuberculated space within them.

A single specimen was obtained from the fishermen's lines by its describers, at Cullercoats, adhering to Bryozoa.

It is nearly allied to *depressa* and *pusilla*.

16. Doris pilosa, Müller.

Doris pilosa, Muller, Zool. Dan. vol. iii. p. 7, pl. 85, f. 5-8.—Johnston, Ann. Nat. Hist. vol. i. p. 54, pl. 2, fig. 9, 10.
„ *nigricans*, Fleming, Brit. Anim. p. 283.
„ *Flemingii*, Forbes, Malac. Mon. p. 3, pl. 1, f. 1-3.

Body ovate, very convex, semitransparent, white, yellowish, brown, or even black. Cloak not ample, soft, pilose with soft, slender papillæ. Dorsal tentacles long, somewhat curved, retractile within denticulated sheaths.

Oral veil produced at the sides into broad, flat, obtuse, tentacula. Branchial plumes seven to nine, large, spreading, not retractile.

Length reaching to an inch and more.

The authors of the " British Nudibranchs," regard the *fusca* of Lovèn, the *sublævis* of Thompson, and their own *similis* as forms of this common species, often found between tide marks on all parts of our coasts.

17. Doris subquadrata. Alder and Hancock.

Alder and Hancock in Ann. Nat. Hist. vol. 16, p. 318, and Monograph, part 5, fam. 1, pl. 16, fig. 1, 2, 3.

Body oblong, rather elevated, white with a yellowish tinge, semi-transparent. Cloak small, scarcely covering the head, and exposing the foot, thickly covered with small unequal papillæ. Dorsal tentacles stout, issuing from smooth-edged sheaths. Oral veil semicircular, with produced obtuse angles. Branchial plumes seven, bipinnate, not retractile.

Length, one inch.

A single specimen was dredged by Mr. Alder, near Berry Head, Torbay.

GONIODORIS, Forbes.

Body oblong or lanceolate, smooth, or slightly tuberculated; cloak small, exposing the head and foot, not furnished with appendages. Tentacles clavate, laminated, not retractile, nor invested with sheaths. Branchial plumes ranged round a dorsal vent, without appendages.

The angular shape and elongated outline of the animals of this genus give them a habit very distinct from that of *Doris*. Many of the exotic species are remarkable for brilliancy of colouring, vivid blues, greens, reds and yellows, often disposed in longitudinal stripes.

1. G. NODOSA, Montagu.

Plate Y. Y. fig. 3.

Doris nodosa, MONT. Lin. Trans. vol. ix. p. 107, pl. 7, f. 2. — FLEMING, Brit. Ann. p. 282.
„ *Barvicensis*, JOHNSTON, Ann. Nat. Hist. vol. i. p. 55, pl. 2, f. 11-13.
Goniodoris nodosa, FORBES, Ann. Nat. Hist. vol. v. p. 105.—ALDER and HANCOCK, Monog. part 2, fam. 1, pl. 18.

Body oblong (about an inch in length), sub-prismatic; white, yellowish, or pink, speckled with opaque white spots. Cloak subquadrangular, carinated in the centre, with a free, scolloped, reflected margin, deeply indented behind. Sides with minute tubercles. Dorsal tentacles clavate, 13-14-laminated on the upper portions; buccal tentacles, obtusely lanceolate. Branchial plumes thirteen, lanceolate, simple pinnate, forming a complete circle round the tubular vent.

Common between tide-marks under stones, in numerous localities all round the British and Irish shores. The *Goniodoris emarginata* of Forbes, and the *G. elongata* of Thompson appear to be varieties of this species.

2. G. CASTANEA, Alder and Hancock.

ALDER and HANCOCK in Annals of Nat. Hist. vol. xvi. p. 314, and Monog. part 3, fam. 1, pl. 19.

Body ovate (less than an inch in length), rather broad and depressed, of a reddish or chestnut brown colour, rarely pale, covered with small conical tubercles, spotted with opaque white. Cloak small, carinated centrally with an ample reflected, smooth, sinuous margin, indented deeply behind. Dorsal tentacles rather short, ten to twelve laminated; buccal tentacles broad, very large, with acuminated tips. Branchial plumes large, tripinnate, seven to nine in number, forming a complete circle of a deep chestnut colour round the vent. Foot broad and expanded.

This fine species was discovered between tide-marks at Salcombe in Devonshire, by Mr. Alder, and afterwards found at Saltcoats in Ayrshire, by Mr. David Landsborough, Jun.

TRIOPA, Johnston.

Body oblong; the mantle edged with filamentous appendages bordering the margins of the back. Tentacles clavate, pectinated, retractile within simple sheaths. Branchiæ few, pinnate, placed about (or in front of) a dorsal vent.

1. T. claviger, Müller.

Plate A. A. A. fig. 1.

Doris clavigera, Muller, Zool. Dan. vol. i. pl. 17, f. 1-3.
Tergipes claviger, Johnston, in Loudon's Mag. Nat. Hist. vol. vii. p. 490, f. 59.
Euplocamus plumosus, Thompson, Ann. Nat. Hist. vol. v. p. 90, pl. 2, f. 4.
„ *claviger*, Thompson, Rep. Brit. Assoc. 1843, p. 250.
Triopa claviger, Johnston, Ann. Nat. Hist. vol. i. p. 124. — Alder and Hancock, Monog. part 4, fam. 1, pl. 20.

The body of this pretty nudibranch is less than an inch in length, of an oblongo-lanceolate shape, flattened above, and of a general white hue, variegated with bright yellow, or orange, that colour being always placed on some of the appendages, as the tubercles of the back, the upper part of the branchial tentacula, and lateral appendages. The latter organs are linear; those of them that are immediately in front, differ from the side ones in being of smaller size, more closely set (eight or so in number), and having tuberculated extremities. The oral tentacles are two, short, truncate, and auriform. The branchial plumes are usually three, linear, and bipinnate. The skin is charged with spicula of various shapes.

It inhabits various depths from low-water-mark to twenty fathoms, and has been observed at localities on all sides of great Britain and Ireland. It ranges to the Norwegian seas.

ÆGIRUS, Lovèn.

Body oblong or elongated, covered with very large tubercles. Tentacles linear, simple, retractile, within prominent lobed sheaths. Branchial plumes dendritic, placed about a dorsal vent.

1. Æ. punctilucens, D'Orbigny.

Plate A. A. A. fig. 2.

Polycera punctilucens, D'Orb. Mag. Zool. vol. v. p. 7, pl. 106.—Thompson, Ann. Nat. Hist. vol. xv. p. 313.
Ægires punctilucens, Loven, Index. Moll. Scand. p. 6.—Alder and Hancock, Monog. part 4, fam. 1, pl. 21.
Doris maura, Forbes, Ann. Nat. Hist. vol. v. p. 103, pl. 2, f. 17.

This very curious sea-slug is of a lanceolate shape, very gibbous on the back, and rough, with large obtuse, somewhat truncate tubercles. It varies in colour from a purplish fawn to jet black, always more or less mottled with blotches of brown, and minute specks of white, but more especially decorated with symmetrically ranged spots of the most brilliant and lustrous greenish-blue, which shine like phosphorescence. The tentacula are linear, and rather obtuse; their sheaths are tuberculated or lobed. The oral tentacles are but slightly developed. The branchial plumes, three in number, are imperfectly tripinnate. The foot is pale, salmon-coloured or whitish. The skin is studded with spicula. It is less than an inch in length.

This curious animal, an inhabitant of the coasts of France and Norway, was first observed in Britain at Campbeltown in Argyleshire (E.F.), and has since been taken by Mr. Alder and Mr. Landsborough elsewhere in the Clyde district; in Cornwall by Mr. Peach; and on the Cork coast, by Professor Allman. It inhabits the margin of the littoral zone.

THECACERA, Fleming.

Body oblong, smooth. Tentacles clavate, pectinated, retractile within sheaths. Head with a simple frontal veil. Branchial plumes pinnate, ranged round a dorsal vent, and surrounded by more or less developed tubercular appendages.

1. T. pennigera, Montagu.

Lin. Trans. vol. xi. p. 17, pl. 4, fig. 5.

"Body oblong, acuminated almost to a point at the posterior extremity, covered with small spots of bright orange and black on all the upper parts; the black markings are smallest, and appear radiated under a lens; the anterior end is sub-bifid, extending at each side into an angular lobe; tentacula two, subclavated and perfoliated; these originate on the upper part, some distance from the anterior end, and each is nearly surrounded by a sort of bipartite wing. The vent is on the back, furnished with five branched appendages, that partly surround it on the fore part, and two large bifid peduncles behind."

Length half an inch.

Milton, Devonshire, at low water (Montagu).

2. T. VIRESCENS, Alder and Hancock.

Body (three-tenths of an inch in length) rather convex, smooth, of a peach-blossom hue, blotched anteriorly and posteriorly with green. Tentacles broadly laminated, green above, pinkish below, retractile within smooth-edged sheaths. Branchial plumes five, green margined with white. A single row of obsolete tubercles encircles the branchial region. Foot white.

This beautiful little animal was discovered at low-water mark, on the oyster-bed at Bar Point, Falmouth, in March, 1849, by Mr. Cocks, and described by the authors of the British Nudibranchiate Mollusca at the Ipswich meeting of the British Association in 1851.

POLYCERA, CUVIER.

Body oblong or elongated, smooth or tuberculated. Tentacles clavate, pectinated, non-retractile, not sheathed. A veil with marginal processes protecting the head. Branchial plume pinnate, ranged about a dorsal vent, and accompanied by clavate or tubercular appendages.

1. P. QUADRILINEATA, Müller.

Plate Y. Y. fig. 5.

Doris quadrilineata, MULLER, Zool. Dan. vol. i. p. 18, pl. 17, f. 4-6 ; and vol. iv. p. 23, pl. 138, f. 5, 6.
„ *cornuta*, ABELDGAARD, Zool. Dan. vol. iv. p. 29, pl. 145.
„ *flava*, MONTAGU, Linn. Trans. vol. vii. p. 79, pl. 7, f. 6.
Polycera lineata, RISSO, Hist. Nat. Eur. Mer. vol. iv. p. 30, pl. 1, f. 5.
„ *flava*, FLEMING, Brit. Ann. p. 283.
„ *ornata*, D'ORBIGNY, Mag. de Zool. vol. vii. p. 9, pl. 107.
„ *typica*, THOMPSON, Ann. Nat. Hist. vol. v. p. 92, pl. 2, f. 5.
„ *quadrilineata*, THOMPSON, loc. cit. pl. 2, fig. 6. — ALDER, Ann. Nat. Hist. vol. iv. p. 338, pl. 9, f. 1-6.
„ *cornuta*, LOVEN, Index Moll. Scand. 6.

Body (sometimes nearly an inch in length) lanceolate, convex, smooth, white, occasionally marked with black, and always variously lineated and spotted with golden yellow, the spots in the back being tubercular. Tentacula clavate, elongate, geniculated, broadly based ; laminations of club nine or ten, yellow ; head veil ample, with from four to six subulate processes, equal or unequal, and tipped with yellow. Eyes minute, closely set at some distance above the tentacle bases. Branchial plumes seven to nine, simply pinnate ; a single lateral appendage, stout, linear, and yellow-tipped on each side.

This beautiful and very variable species is generally diffused through the European seas, and has been taken chiefly in the laminarian zone on all sides of Great Britain and Ireland, often in considerable abundance.

2. P. Lessonii, D'Orbigny.

Polycera Lessonii, D'Orbigny, Mag. Zool. vol. vii. p. 5, pl. 105.—Alder and Hancock, Monog. part 4, fam. 1, pl. 24.
„ *citrina,* (young), Alder, Ann. Nat. Hist. vol. vi. p. 340, pl. 9, f. 7-9.
„ *modesta,* Lovèn, Ind. Moll. Scand. p. 6.

Body (about half an inch in length, or more) lanceolate-oblong, convex, greenish or yellowish, corrugated, covered with scattered yellowish tubercles. Tentacula subclavate, obtuse, ornamented with twelve or thirteen laminations ; head-veil small, many-lobed. Eyes very minute. Branchial plumes three, small, bipinnate, greenish ; their lateral appendages tuberculated, subramose.

Common in the coralline region, living on *Gemellaria loriculata* on the Northumberland coast ; also found in Dublin Bay (Alder). It inhabits the shores of France, Sweden, and probably North-east America.

3. P. OCELLATA, Alder and Hancock.

Ann. Nat. Hist. vol. ix. p. 33, and Monog. pt. 2, fam. 1, pl. 23.

Body (less than an inch in length) lanceolate-oblong, convex, greenish black, mottled with large yellowish tubercular spots. Tentacula elongated, with tumid bases, and clavate (seven or eight) laminated tips; head-veil small, many-lobed. Branchial plumes five, large, sub-tripinnate, unequal, their appendages lobed and branched, whitish. Foot pale.

It inhabits the shore between tide-marks, and shallow water. It has been taken on the Northumberland, Devon, and Dublin coasts (Alder and Hancock).

IDALIA, LEUCKART.

Body oblong, broad, more or less smooth, a semicircle of filamentous appendages surrounding the branchial region of the back. Dorsal tentacula linear, laminated, sustentacular simple appendages anterior to, and distinct from them. No produced oral tentacles, but a veil. Vent dorsal, surrounded by plumose branchiæ.

1. I. ASPERSA, Alder and Hancock.

Monog. part 1, fam. 1, plate 26.

Body (half an inch in length) thick, broad, oblong, rounded in front, tapering to a point behind; yellowish, blotched and spotted with brown and orange; sides speckled with opaque white. Dorsal tentacles linear, delicately laminated, reflexed. Tentacular appendages four, long, tapering, subæqual; their bases approximated and close to those of the tentacles. Branchial plumes twelve, short, simply pinnate, forming a complete non-retractile circle, fawn-coloured. The surrounding filamental appendages, four on each side, tapering, short, the three anterior distant from each other, the fourth and posterior very close to, and shorter than the third. Caudal extremity carinated.

Coast of Northumberland, from the coralline region; discovered by the authors of the "British Nudibranchiate Mollusca."

2. I. INÆQUALIS, Forbes.

Plate Y. Y. fig. 4.

Body oblong, flattened, but very thick, truncate in front, suddenly tapering, pointed behind. Back circumscribed, elevated with steep sides. Dorsal tentacula linear, laminated; tentacular appendages set well apart, filiform, the anterior pair shortest, the lateral or posterior pair very long, longer than the tentacula immediately in front of which they are set. The animal when crawling usually carries its tentacles obliquely reflexed, the anterior appendages curved upwards, and the long ones directed sideways and backwards. The branchiæ are from seven to nine in number, forming a complete and erect circle; on each side of them are five or six rather short, unequal filamentous processes, the anterior ones approximated. The general colour is grey, speckled with white, yellow, and brown. An opaque yellow line runs down the centre of the tail, with dots of the same colour on each side of it. The sides of the back are specked with madder brown and yellow. The branchial plumes are tipped with purplish brown, and banded centrally with white. The length of the body is rather more that half an inch.

Two examples of this beautiful sea-slug, nearly allied to the last, but presenting distinct characters in the proportions and disposition of the tentacular and branchial appendages were dredged in thirty-five fathoms water on a sandy bottom in St. Magnus Bay, Zetland (M'Andrew and E. F.). When kept they appeared to be sluggish, and are very glutinous to the touch.

3. I. QUADRICORNIS, Montagu.

Lin. Trans. vol. xi. p. 17, pl. 14, fig. 4.

"Body ovate, mottled brown and white; along each side an obsolete row of tubercles, somewhat dilatable, extending from the tentacula to the vent; tentacula four, long, both pairs originating from the upper part, and approximating; the anterior shortest, setiform, inclining forwards; the others filiform, reflecting backwards, the same colour as the body; vent situated near the extremity of the back, surrounded by eight or nine branched appendages. Length three-eighths of an inch." (Montagu) Devon.

ANCULA, LOVÈN.

Body elongated, smooth, a semicircle of simple filaments or clavate processes bordering the branchial region of the back. Tentacula clavate, laminated with filiform appendages on their stalks. No capital veil. Vent dorsal, surrounded by plumose branchiæ.

A. CRISTATA, Alder.

Plate Z. Z. fig. 4.

Polycera cristata, ALDER, Ann. Nat. Hist. vol. vi. p. 340, pl. 9, f. 10-12.
Ancula cristata, LOVÈN, Ind. Moll. Scand. p. 5.—ALDER and HANCOCK, Monog. part 3, fam. 1, pl. 25.

Body half an inch long, convex, lanceolate, tapering behind, translucent white, smooth, bearing on the central and most elevated part of the back three white yellow-tipped bipinnate ramose branchial plumes, surrounding the vent, and surrounded by about ten linear stout processes, white, tipped with bright orange. An orange line down the centre of the back. Dorsal tentacles with long stout peduncles each furnished with two linear orange-tipped processes; club of the tentacles with eight or ten broad yellow laminæ. Eyes placed rather closely together at their bases. Buccal tentacles oblong, obtuse, yellow-tipped. Foot linear.

This mollusk inhabits the littoral zone under stones; it has been taken on the Northumberland and Durham coasts, on the south coast of England, and in Dublin Bay (A. and H.). Mr. Price finds it in the estuary of the Mersey, and Mr. Harry Goodsir observed it at Anstruther, in Fifeshire. It ranges to the Norwegian seas.

TRITONIADÆ.

The nudibranchs of this family have laminated, plumose or papillose branchiæ arranged along the sides of the back. The stomach in all is quite simple.

TRITONIA, Cuvier.

Body prismatic, often thick and firm. Tentacles two, ramose, and filamentous, more or less brush-shaped, retractile within tubular sheaths. Head with a tuberculated or digitated veil. Branchiæ ramose, arranged in a single series, along a ridge bordering each side of the back.

The species of this genus sometimes grow to a large size, and the first we have to notice is a giant among British Nudibranchiata.

1. T. hombergi, Cuvier.

Plate A. A. A. fig. 3.

Tritonia Hombergi, Cuvier, Mem. Moll. iv. 4, pl. 1 and 2. — Fleming, Brit. An. p. 284. — Johnston, Ann. Nat. Hist. vol. i. pl. 114, p. 3, f. 1, 2.

Body oblong, quadrilateral, the back slightly convex, warty, of a general pink or purple colour, with bluish markings, sometimes entirely of an amber yellow. Branchiæ frondose and ramified, fringing in numerous close-set tufts the angles of the back. Head-veil bilobed and much fimbriated. Tentacles tufted, issuing from wide sheaths, with scalloped margins. This fine species grows to half a foot, and even more, in length.

It occurs on both our east and west coasts, but is scarce. The largest specimens we have met with were taken on the scallop banks, in twenty-five fathoms water, off the north coast of the Isle of Man.

2. T. PLEBEIA, Johnston.

Tritonia plebeia, JOHNSTON, in Edinb. New Phil. Journal, vol. v. p. 77, and Ann. Nat. Hist. vol. i. p. 115, pl. 3, f. 3, 4. — ALDER and HANCOCK, Monog. part 3, fam. 2, plate 3.
„ *pulchra* (VAR.) JOHNSTON, Edin. New Phil. Jour. vol. v. p. 78.

Body (an inch or more in length) lanceolate, quadrilateral, with subparallel sides for a great part of its length, truncate in front, tapering behind, yellow or yellowish-brown, with brown markings, and often opaque white specks. Margins of the back not waved, edged by five or six (on each side) branchial tufts, which are distant, small, erect, pinnate and inæquilateral. Head veil entire, scalloped, edged by six simple tentacular points. Dorsal tentacles issuing from entire-edged cylindrical sheaths; they terminate in a fasciculus of simple filaments.

Very generally distributed in the British seas. It inhabits the coralline zone, and lives upon zoophytes.

3. T. LINEATA, Alder and Hancock.

Ann. Nat. Hist. 2nd series, vol. i. p. 191, and Monog. part 5, fam. 2, plate 4.

Body (less than an inch in length) very slender, linear, quadrilateral, pellucid white with an opaque white line along each simple margin of the back. Branchiæ slender, white, imperfectly bipinnate, arranged distinctly four or five on each side. Head veil produced in front into four long filaments, the inner ones longest. Tentacles terminating in a tuft of unequal laminated filaments, retractile within sheaths which have scalloped margins.

Taken by the authors of the "British Nudibranchiata," and by Mr. Bean, under rocks at low water at Scarborough.

SCYLLÆA, Linnæus.

Body oblong or elongated, with compressed sides, a convex back, and a linear foot. On each side of the back are two large wing-like lobes bearing small ramose branchiæ on their inner surfaces. The tentacles are two, dorsal in position, terminating in lamellated clubs, and retractile within ample sheaths. The orifices are placed at the right side.

The animals of this genus are remarkable for being the only nudibranchiate mollusks possessed of an armed gizzard. They are oceanic, living on floating sea-weeds, the stems of which they firmly clasp with the infolded sides of their narrow crawling disk. Their anatomy has been made the subject of elaborate investigation, formerly by Cuvier, more recently by Alder and Hancock.

S. pelagica, Linnæus.

Plate A. A. A. fig. 5.

Cuvier, Ann. du Museum, vol. vi. p. 416.

We have never taken this animal in the British seas, but it has been recently met with on the Devon coasts (Alder). Mediterranean examples, which we have examined alive, were of a general tawny yellowish hue, and fully an inch in length.

EOLIDIDÆ.

This tribe consists of Nudibranchs that have a ramified stomach, and papillose or branched branchiæ ranged along the sides of the back. It includes many of the most elegant molluscs that have yet been discovered, and in no family of the animal kingdom can we find more graceful outlines or more brilliant and harmonious colouring.

LOMONOTUS, Verany.

Body linear or lanceolate, smooth. Head covered by a veil. Tentacles clavate, laminated, retractile within a sheath. Branchiæ papillose set on the undulated margins of the mantle along the sides of the back.

1. L. marmoratus, Alder and Hancock.

Plate Z. Z. fig. 3.

Eumenis marmorata, Alder and Hancock, Ann. Nat. Hist. vol. xvi. p. 311, and Monog. part 3, fam. 3, pl. 1. *a*.

Body (more than half an inch long) linear-lanceolate, quadrilateral, olive or yellowish-brown, streaked or spotted with chocolate brown and white. Head-veil small, with small tubercular points. Dorsal tentacles ovato-clavate, fawn-coloured, rising out of close sheaths, with simple margins. Pallial margins three or four times undulated, set with irregular papillose branchiæ of a fawn colour, with pale edges. Sides of the body striated with dark brown. Anterior margin of foot duplicated and produced at the angles into long tentacular processes.

Dredged by Mr. Alder near Berryhead, Torbay.

2. L. flavidus, Alder and Hancock.

Eumenis flavida, Alder and Hancock, Ann. Nat. Hist. vol. xviii. p. 293.

Body (a quarter of an inch in length) quadrilateral, pale lemon-yellow above, white beneath. Head-veil very small, with about four tubercular points. Dorsal tentacles clavate, rising out of sheaths set at the tops with six tubercles, of which the outer one is largest. Branchiæ papillose, mostly short, set in a waved line on the sides of the back, three on each side being larger than the rest, and nearly linear; all ringed with fawn colour. Sides of the body with a few pale yellow markings. Foot produced into tentacular points at its angles.

Lamlash bay, dredged on a coralline (Alder and Hancock).

DENDRONOTUS, Alder and Hancock.

Body elongated, prismatic. Tentacles clavate, laminated, retractile within tubular sheaths; front of the head with branched appendages; branchiæ ramose, arranged in a single series down each side of the back. Foot linear.

This genus has the habit of *Tritonia.*

D. arborescens, Müller.

Plate Z. Z. fig. 5.

Doris arborescens, Muller, Zool. Dan. Prod. p. 229.
Tritonia arborescens, Cuvier, Ann. du Mus. vol. vi. p. 434, pl. 61, f. 8, 9, 10.— Fleming, Brit. Ann. p, 284.
„ *lactea*, (var.) Thompson, Ann. Nat. Hist. vol. v. p. 88, pl. 2, f. 3.
„ *pulchella*, (var.) Alder and Hancock, Ann. Nat. Hist. vol. ix. p. 33.
„ *felina*, (var.) Alder and Hancock, Ann. Nat. Hist. vol. ix. p. 33.

Body (two inches and more in length) linear-oblong, narrow, steep-sided, rounded dorsally, very variously coloured, but most usually of some shade of crimson, variegated with madder brown, and speckled with opaque white; the painting often beautifully and curiously disposed. Head-veil very short, its appendages long and pinnated. Dorsal tentacles clavate, yellowish, in long closely-fitting tapering sheaths, with ramified and radiating marginal processes. Branchiæ forming six or seven large dendriform tufts on each side, decreasing towards the tail. Foot very narrow, linear, rounded in front.

This wonderfully beautiful sea-slug creeps upon corallines in the laminarian and coralline zones, and is often taken among sea-weeds between tide marks. It is found on most parts of the British shores, but especially in the north.

DOTO, Oken.

Body elongated, subprismatic. Head covered by a simple veil. Dorsal tentacula two, linear, retractile within trumpet-shaped sheaths. Branchiæ ovate or clavate, rough with whorls of tubercles, deciduous, ranged in single file along each margin of the back. Foot linear. Reproductive orifices and vent at right side.

The animals of this genus are prismatic slugs, decorated on each side with a row of muricated branchiæ resembling pineapples, or pine-cones, in miniature. They appear to feed upon hydroid zoophytes.

1. D. coronata, Gmelin.

Plate A. A. A. fig. 4.

Doris coronata, Gmelin, vol. i. p. 3105, No. 19.
Melibœa coronata, Johnston, Ann. Nat. Hist. vol. i. p. 117, pl. 3, f. 5-8.
„ *ornata*, Alder and Hancock, Ann. Nat. Hist. vol. ix. p. 34.

Doto coronata, LOVÈN, Arch. Skand. Nat. p. 151. — ALDER and HANCOCK, Monog. part 2, fam. 3, p. 66.

Body (half an inch in length) linear, yellowish, spotted with crimson. Head-veil broad, entire. Dorsal tentacles filiform, transparent, truncated at their tips, rising out of long trumpet-shaped sheaths. Branchiæ five to seven on each side, large, spindle-shaped, muricated with four or five whorls of pointed tubercles, each tipped by a crimson spot.

Not uncommon in the coralline zone, inhabiting the branches of *Plumulariæ* and *Sertulariæ;* occasionally found in the laminarian and littoral zones. We have taken it as deep as fifty fathoms. The *Doris pinnatifida* of Montagu, and possibly also his *Doris maculata* are considered by the authors of the "British Nudibranchiata" as varieties of this beautiful species.

2. D. FRAGILIS, Forbes.

Plate A. A. A., fig. 4.

Tritonia pinnatifida, JOHNSTON, Loud. Mag. Nat. Hist. vol. viii. p. 61, f. 4.
Melibæa pinnatifida, JOHNSTON, Ann. Nat. Hist. vol. i. p. 116.
„ *(Doto) fragilis*, FORBES, Mal. Mon. p. 4, pl. 1, f. 4.
Doto fragilis, ALDER and HANCOCK, Monog. part 5, fam. 3, plate 5.

Body (about an inch long) linear, stout, olive-brown or yellowish. Head-veil produced and rounded at the sides. Dorsal tentacles filiform, tapering, brown, issuing from broad-mouthed, trumpet-shaped sheaths. Branchiæ six to nine in number, large, ovate, stout, brownish-yellow without spots, approximate, muricated with from seven to nine whorls of obtuse papillæ.

It lives on the coralline *Antennularia* in most parts of the British seas. The branchiæ frequently fall off at the slightest touch.

OITHONA, Alder and Hancock.

"Body elongated, limaciform; head with four linear tentacles, without sheaths, constituting two pairs, both subdorsal; the anterior pair corresponding to the oral tentacles of *Eolis*, being situated considerably behind the lips. Mouth with corneous jaws. Branchiæ papillary, clothing irregularly a sub-pallial expansion on the sides of the back, and meeting posteriorly; a produced membranous margin or fringe runs down the inner side of each papilla. Vent latero-dorsal, situated towards the right side. Orifices of reproductive system separate; situated below the tentacles on the right side."

O. nobilis, Alder and Hancock, MSS.

Body pale buff, or whitish, smooth. Tentacula long, tapering, equal. Branchiæ linear, conical, with strongly-waved and wide lateral fringes, their apices (also the back) iridescent. Foot long and lanceolate. Length two inches.

Discovered by Mr. Cocks, under a stone at low-water, near Bar Point, Falmouth. Described by the authors of the "British Nudibranchiata," in a communication to the British Association at Ipswich in 1851.

EOLIS, Cuvier.

Body ovate or linear; no mantle. Head with four non-retractile tentacles, not invested by sheaths; almost always linear; the dorsal ones rarely bulbed, sometimes ringed. Branchiæ simple, cylindrical, papillose, ranged in series or fascicles, along the margin and sides of the back, in some species nearly covering it. Foot linear or lanceolate. Orifices of generative system and vent at the right side.

Section I. Eolis.—Branchiæ numerous, depressed, and imbricated. Body broad. Tentacles smooth. Spawn of numerous waved coils.

1. E. papillosa, Linnæus.

Plate B. B. B. fig. 1, (var. Zetlandica).

Limax papillosus, Linnæus, Syst. 1082.
Doris papillosa, Muller, Zool. Dan. t. cxlix. f. 1-4.—Montagu, Lin. Trans. vol. xi. p. 16, pl. 4, f. 2.
Tritonia papillosa, Fleming, Ed. Enc. xiv. p. 619.
Eolida papillosa, Fleming, Brit. An. p. 285.—Johnston, Loudon's Mag. Nat. Hist. vol. viii. p. 376.—Ann. Nat. Hist. vol. i. p. 118.
Doris vermigera, Turton, Brit. Fauna, p. 133.
Eolis Zetlandica, (var.) Forbes and Goodsir, Proc. Brit. Assoc. 1839; Athenæum, No. 618, p. 647.
„ *rosea*, (var.) Alder and Hancock, Ann. Nat. Hist. vol. ix. p. 34.
„ *obtusalis*, (var.) Alder and Hancock, Ann. Nat. Hist. vol. ix. p. 34.

This very variable species is the largest of our British *Eolidæ*, attaining a length of nearly three inches. Its body is oblong, thick, and broad, gradually becoming pointed behind. It is usually of a brownish purple colour, with opake white specks. The middle of the back is smooth, the sides are thickly clothed with reflected and appressed oblong branchiæ, ranged in more or less distinct rows, from six to twenty in number, according to size, and each composed of from four to six or more branchiæ. They are all olive, pink, brown, or more rarely yellowish. The dorsal tentacula are rather short, stout, and wrinkled; the oral ones are simple and short. The foot is white.

This species lives chiefly at the edge of low water, but occurs also deeper. It is found not uncommonly in the Frith of Forth (E. F.); in Berwick bay (Johnston); and on the Northumberland coast (Alder and Hancock.) We have taken it abundantly in Zetland (E. F). It occurs in many localities elsewhere on the English coast. Also on the north, east, and west of Ireland (W. Thompson). It has a wide range along the European shores of the Atlantic.

2. E. Peachii, Alder and Hancock.

Ann. Nat. Hist. 2nd series, vol. i. p. 190.

"Body rather flat, yellowish white. Dorsal tentacles longish and smooth. Oral tentacles shorter. Head broad and rounded, angulated at the sides. Branchiæ very numerous, and thickly set, passing round the dorsal tentacles so as nearly to unite in front, and terminating behind very near the tail. The papillæ are nearly linear, slender, with a brownish central vessel, and having the apices sprinkled with opake white spots. Foot rather thin and broad, arched in front, with obtuse angles. Length three-quarters of an inch." A. and H.

Fowey harbour, Cornwall (Peach, Alder); Cullercoats, Northumberland (Alder).

3. E. glauca, Alder and Hancock.

Ann. Nat. Hist. vol. xvi. p. 314, and Monog. part 4, fam. 3, pl. 11.

Body (nearly two inches long) subdepressed, elongated, tapering and mucronate behind, pale red. Branchiæ vermicular, subconic, subcompressed, glaucous green, pale-tipped, speckled with brown and white, very numerous, in about fourteen of ten or twelve papillæ each, the anterior rows subdividing and clustering below. Tentacles subulate, smooth. Anterior angles of foot produced.

Dredged off Berry Head, Torbay (Alder).

Section II. Flabellina.— Branchiæ clustered. Body slender. Dorsal tentacles usually wrinkled or laminated. Buccal ones long. Spawn of many coils.

4. E. coronata, Forbes.

Eolida coronata, Forbes, Proc. of Brit. Assoc. in Athenæum for 1839, No. 618, p. 647. — Alder and Hancock, Monog. part 2, fam. 3, plate 12.

Body (an inch long) linear-lanceolate, white tinged with pink. Branchiæ linear, cylindrical, crimson, blotched with blue, and tipped or ringed with opake white, arranged in six or seven clustered or transverse rows, the anterior ones consisting of numerous (20-30) papillæ, the hinder ones gradually decreasing. Dorsal tentacles yellowish, subclavate, coronated with lamellar rings. Oral tentacles long, slender, simple. Anterior angles of foot produced.

Not uncommon in the Scottish seas; generally distributed around all our shores. It inhabits the laminarian zone.

5. E. longicornis, Montagu.

Doris longicornis, Montagu, Linn. Trans. vol. ix. p. 107, pl. 7, fig. 1.
Montagua longicornis, Fleming, Brit. Ann. p. 285.

Body (half an inch long) lanceolate, yellowish-white. Dorsal tentacles short (as figured they are clavate and smooth); oral ones very long (smooth). Branchiæ in transverse rather distant series occupying nearly the whole of the back, the first row clustered, the remainder longer, and ranged in four ranks, all pink, spotted with white.

South coast of Devon (Montagu). No animal exactly agreeing with it has been found of late years.

6. E. Drummondi, Thompson.

Eolis Drummondi, Thompson, Rep. Brit. Assoc. for 1843, p. 250; and, previously, as *Eolidia rufibranchialis* in Ann. Nat. Hist. vol. v. p. 89. — Alder and Hancock, Monog. part iv. fam. 3, plate 13.

(var.) *Eolis tenuibranchialis*, Alder and Hancock, Ann. Nat. Hist. vol. xvi. p. 315.

(var.) *Eolis curta*, Alder and Hancock, Ann. Nat. Hist. vol. xii. p. 234.

Body (an inch or more in length) ovato-lanceolate, whitish, tinged with red. Tentacula (dorsal) long, cylindrical, ringed; oral tentacles very long, slender, simple. Branchiæ of various shades of reddish brown, ringed with white near their tips, long, linear, set in from four to six lateral clusters, each of several rows of six or fewer papillæ. Angles of foot much produced.

This species appears to occur in localities at intervals all round our shores, and inhabits the littoral and laminarian zones.

7. E. rufibranchialis, Johnston.

Eolidia rufibranchialis, Johnston, Loudon's Mag. Nat. Hist. vol. v. p. 428.— Ann. Nat. Hist. vol. i. p. 121.—(*Eolis*), Alder and Hancock, Monog. part 4, fam. 3, pl. 14.

„ *Embletoni*, Johnston, Loudon's Mag. Nat. Hist. vol. viii. p. 121.

Body (an inch long) linear, tapering, yellowish-white. Dorsal tentacula rather long, subulate, transversely wrinkled; oral tentacles as long, simple. Branchiæ bright-red or brown, with a white ring near the tips, rather short, linear, in six or seven rather irregular clusters on each side, each of several rows of about four papillæ. Angles of the foot produced.

Between tide marks, and in the laminarian zone on the east coast of England and Scotland, in the Frith of Clyde, and Irish sea.

8. E. PUNCTATA, Alder and Hancock.

Ann. Nat. Hist. vol. xvi. p. 315, and Monog. part 2, fam. 3, pl. 15.

Body (an inch long) linear-lanceolate, yellowish-white, speckled with opake white spots. Dorsal tentacles yellow, rather short, conico-subulate, obliquely laminated; oral ones very long, tapering white. Branchiæ oblongo-subulate, brownish, with pale tips, arranged on each side in six or seven clusters, the anterior ones of three and two rows each, thirty or forty papillæ in the first cluster. Angles of the foot much produced.

In rather deep water, Torbay (A. and H.).

9. E. LINEATA, Lovèn.

Eolis lineata, LOVÈN, Ind. Moll. Scand. p. 8. — ALDER and HANCOCK, Ann. Nat. Hist. vol. xviii. p. 294, and Monog. part 5, fam. 3, plate 16.

Body (an inch long) linear, white, with three longitudinal opake white lines. Dorsal tentacles subulate, faintly wrinkled, yellowish, with an opaque white line on their backs; oral ones slightly longer, similarly marked. Branchiæ linear, crimson, with a white ring near their tips, and a line down their fronts, arranged in 4-5, mostly undefined clusters, of about sixteen and fewer papillæ. Foot with the anterior angles moderately produced.

In the littoral and laminarian zones. Ayrshire (D.

Landsborough, Jun.); Isle of Man (Alder). It inhabits the Scandinavian seas.

10. E. elegans, Alder and Hancock.

Ann. Nat. Hist. vol. xvi. p. 316, and Monog. part 5, fam. 3, pl. 17, figs. 2, 3, 4.

Body (half an inch long) linear-lanceolate, yellowish-white. Dorsal tentacles rather short, strong, wrinkled, fawn-coloured; oral ones twice as long, simple, marked, and connected by a white line. Branchiæ numerous, linear, rosy, white-tipped, brown at each end of the red portions; arranged on each side in about seven dense, approximated clusters. Foot with produced angles.

In fifteen fathoms off Berry Head, Torbay (A. and H.).

11. E. smaragdina, Alder and Hancock.

Monog. part 5, fam. 3, pl. 17, fig. 1.

Body (half an inch long) linear, white. Dorsal tentacles large, smooth; oral ones equal, simple. Branchiæ long, somewhat clavate, green centrally, with pellucid tips, arranged on each side in five rather distant clusters. Angles of foot produced.

In the littoral zone at Whitley, Northumberland (A. and H.).

12. E. gracilis, Alder and Hancock.

Ann. Nat. Hist. vol. xiii. p. 166.

Body (half an inch long) very slender, white. Dorsal tentacles very long, linear, opake white above; oral ones as long. Branchiæ long, slender, ginger-orange, with a minute white ring near their tips, ranged in four or five clusters, of seven or fewer papillæ on each side. Angles of foot much produced.

Littoral zone, at Cullercoats, Northumberland (A. and H.).

13. E. PELLUCIDA, Alder and Hancock.

Ann. Nat. Hist. vol. xii. p. 234, and Monog. part 3, fam. 3, pl. 19.

Body (nearly an inch long) white, linear lanceolate. Dorsal tentacles long, subulate, white-tipped, annularly wrinkled; oral ones as long, simple. Branchiæ long, linear sub-conical, bright carmine, with white tips, ranged in five or six clusters on each side, of seventeen and fewer papillæ. Foot much produced at the anterior angles.

On a Tubularia from the fishing-boats, Cullercoats (A. and H.).

The *Eolis Cuvieri* of Johnston probably falls under this species. On it, Mr. Alder remarks in a letter, "Quere, if our *pellucida?* Certainly not the *Cuvieri* of French authors, nor the one figured by Cuvier."

14. E. LANDSBURGI, Alder and Hancock.

Ann. Nat. Hist. vol. xviii. p. 294, and Monog. part 4, fam. 3, pl. 20.

Body (three-tenths of an inch long) linear-lanceolate, of a beautiful violet colour. Dorsal tentacles rather long, linear, violet, tipped with white, as also are the longer oral ones. Branchiæ rather short and stout, linear, slightly clavate, orange, with a white apical ring, ranged in five or six clusters on each side, of twelve and fewer papillæ. Anterior angles of foot slightly produced.

Discovered at Saltcoats by Mr. David Landsborough, Jun.

15. E. PURPURASCENS, Fleming.

Phil. Zool. vol. ii. p. 470, pl. 4, fig. 2, and Brit. Ann. p. 286.

Body (about an inch long) slender, pointed behind, rounded in front, pink. Labial tentacles shorter than the (linear) dorsal ones. Five bundles, each of three filiform branchiæ, on each side.

Frith of Tay (Fleming). An obscure species, requiring re-investigation.

16. E. ALBA, Alder and Hancock.

Ann. Nat. Hist. vol. xiii. p. 164, and Monog. part 1, fam. 3, pl. 21.

Body (half an inch long) linear, white. Dorsal tentacles rather long, smooth, brown below, surrounded near the slender tips by a bulbous ring ; oral ones longer, linear, white. Branchiæ white, often with a greenish ring near the tips, linear-oblong, ranged in five or six clusters on each side, approximated dorsally, the first two of two rows of six or seven papillæ. Angles of foot greatly produced.

Shallow water and littoral zone. In the Frith of Clyde and Dublin Bay (A. and H.).

Section III. CAVOLINA.—Body lanceolate ; dorsal tentacles smooth or wrinkled. Branchiæ in transverse, generally rather distant rows. Spawn of one or two coils.

17. E. STIPATA, Alder and Hancock.

Ann. Nat. Hist. vol. xii. p. 233.

Body (one quarter of an inch long) rather broad, and depressed, bright yellowish green. Tentacula short.

Branchiæ bluish-green, arranged in nine rows, covering the whole of the back.

Torbay (A. and H.).

18. E. INORNATA, Alder and Hancock.

Annals Nat. Hist. vol. xvi. p. 315.

Body (four-tenths of an inch in length) ovate-oblong, rather depressed, tapering to a fine point behind, white or fawn-coloured. Tentacles all equal, rather short and thick. Branchiæ of a dull brownish orange freckled with brown and white, their apices white; ranged in eight or nine rows of four or five papillæ each. Foot white.

Littoral zone, under stones, Torbay (A. and H.).

19. E. ANGULATA, Alder and Hancock.

Ann. Nat. Hist. vol. xiii. p. 165, and Monog. part 2, fam. 3, pl. 23.

Body (four-lines long) depressed, oblong, rapidly tapering behind, pale orange. Dorsal tentacles short, obtuse, orange tipped with white; oral ones longer, linear, white. Branchiæ cylindrical, rather long, orange with white tips, and opake white blotches. Foot broad, tinged with orange.

Cullercoats, probably from deepish water (A. and H.).

20. E. CONCINNA, Alder and Hancock.

Ann. Nat. Hist. vol. xii. p. 234, and Monog. part 1, fam. 3, pl. 24.

Body (half an inch long) lanceolate, yellowish white. Dorsal tentacles linear, tapering, white-tipped, with approximate bases; oral ones shorter. Branchiæ oblong, subconical, purplish brown, and granulated centrally; tinged with blue externally, and tipped with white;

ranged in nine or ten transverse rows of five papillæ each; back bare. Foot linear.

Littoral zone, Northumberland (A. and H.).

21. E. nana, Alder and Hancock.

Ann. Nat. Hist. vol. ix. p. 36, and Monog. part 4, fam. 3, pl. 25.

Body (four lines long) oblongo-ovate, rather depressed; obtuse behind, pale yellowish, with white head and tentacula. Dorsal and oral tentacles smooth, the latter rather the shorter. Head rounded and dilated at the sides, produced in front. Branchiæ subclavate, rose-coloured centrally, tipped with white, arranged in eight to ten close transverse rows of five to six in each. Back smooth. Foot obtusely angled in front.

In the littoral zone on the Northumberland coast (A. and H.).

22. E. olivacea, Alder and Hancock.

Ann. Nat. Hist. vol. ix. p. 35, and Monog. part 1, fam. 3, pl. 26.

Body (half an inch long) lanceolate, yellowish, speckled with opake white. Dorsal tentacles, short, obtuse, approximated, yellow speckled with white, and centrally banded with red; oral tentacles shorter; both are smooth. Branchiæ oblong, cylindrical, yellowish brown, with belts of granulated olive spots, pale at their tips, ranged in six to eight rows of three or four nearly equal papillæ. Angles of foot obtuse.

Northumberland, Durham, and Frith of Clyde, in the littoral zone (A. and H.).

Mr. Alder has suggested to us that the *Eolis foliata* (Forbes and Goodsir) described in the British Association in 1839, and found in Zetland, is probably the young of this species. He remarks that some Scottish specimens of *Eolis olivacea* have the branchiæ strongly banded with brown; and that in the young state it has very few branchiæ ranged in single or double series.

23. E. AURANTIACA, Alder and Hancock.

Ann. Nat. Hist. vol. ix. p. 34, and Monog. part 5, fam. 3, pl. 27.

Body (half an inch long) lanceolate, tapering and pointed behind, pale buff. Dorsal tentacles not very long, a little wrinkled, tapering, tinged centrally with orange red, their bases approximated; oral tentacles rather shorter, colourless, obtuse. Branchiæ linear-oblong, stout, centrally red, terminally white, with an orange ring, ranged in ten or eleven close lateral rows of from two to six papillæ. Foot white, slightly lobed in front.

Northumberland, Ayrshire, and Cornwall, in the littoral and laminarian zones (A. and H.). The authors of the monograph of "British Nudibranchiate Mollusca" suggest the probable identity of *Eolis bellula* of Lovèn with this species.

24. E. CINGULATA, Alder and Hancock.

(*E. Histrix*) Ann. Nat. Hist. vol. ix. p. 35, and Monog. fam. 3, plate 28.

Body (three-eighths of an inch long) linear-lanceolate, tapering and pointed behind, white variegated with olive brown, especially along the sides. Dorsal tentacula long, linear, smooth belted with olive below, and orange brown above; oral tentacles half as long, belted with orange brown. Branchiæ spindle-shaped, large, pale or olive, belted with dark olive, and ranged in eight or more distant, transverse rows of three to five in each. Foot linear, white, with the anterior angles subproduced and rounded.

Cullercoats, in the littoral zone (Alder).

25. E. VITTATA, Alder and Hancock.

Ann. Nat. Hist. vol. ix. p. 35.

"Body slender, pale buff, speckled with fawn-colour. Head rather large, and truncated in front. Dorsal tentacula slightly conical, wrinkled, fawn-coloured, with pale tips. Oral tentacula rather shorter than the dorsal ones, and of the same colour. Branchiæ somewhat clavate, long, with obtuse terminations, very pale fawn-coloured, with three darker bands of the same colour; set in six or seven distant rows down the sides, largest in front, four to seven in each row. Length $\frac{3}{10}$ths of an inch.

"On a coralline from deep water; Cullercoats; one specimen only found?" (A. and H.)

26. E. GLOTTENSIS, Alder and Hancock.

Ann. Nat. Hist. vol. xviii. p. 293.

Body and tentacles pale greenish-yellow. Dorsal tentacles long, smooth, and thickened towards their tips; oral ones two-thirds of the length of the former. Branchiæ rather short and thick, centrally blackish-green, their apices deep orange yellow, ranged in eight or nine transverse rows, each of three to five papillæ; the first three rows approximated. Foot white; anterior angles slightly produced and rounded. Length $\frac{4}{10}$ths of an inch.

Dredged in Lamlash bay (A. and H.).

27. E. amœna, Alder and Hancock.

Ann. Nat. Hist. vol. xvi. p. 316, and Monog. part 2, fam. 3, pl. 30.

Body (three lines long) greenish-white, speckled with brown and white, linear, tapering and pointed behind. Dorsal tentacles long, cylindric wrinkled, white-specked, and ringed at about a third of their length from the lips with brown; oral ones half as long, obtuse. Branchiæ large, linear, green, yellow-spotted and white-tipped, arranged in eight tranverse rows of three to four papillæ, the three anterior rows contiguous, the others distant. Foot linear, obtusely angulated in front.

Dredged at Torbay (Alder).

28. E. Northumbrica, Alder and Hancock.

Ann. Nat. Hist. vol. xiii. p. 165, and Monog. part 3, fam. 3, pl. 31, figs. 2 and 3.

Body (a quarter of an inch long) greenish, linear. Dorsal tentacles rather long, cylindrical truncate, white, and ringed on their upper halves; oral ones as long, truncated. Branchiæ subclavate, bluish green with white tips, ranged in nine transverse distant rows, the first two of three papillæ, the third of five, and the remainder gradually of fewer. Foot obtusely angulated in front.

On a coralline, Cullercoats (A. and H.).

29. E. arenicola, Forbes.

Alder and Hancock, Monog. part 3, fam. 3, pl. 31.

Body (less than an inch in length) linear-lanceolate, white. Dorsal tentacles long, linear, smooth; oral ones rather shorter; both white, tinged in their middle portions with yellow. Branchiæ long, linear, centrally of a dark green, belted with yellow above, and tipped with white ; they are ranged in fifteen rows of three or four in each row, the outermost series smallest. Foot linear, rounded at the anterior angles.

In ten fathoms water, weedy bottom. Menai Straits (E. F.).

30. E. VIRIDIS, Forbes.

Ann. Nat. Hist. vol. v. p. 106, pl. 2, fig. 18.

Body (a quarter of an inch long) white, linear-lanceolate, tapering behind. Dorsal tentacles white, long, wrinkled ; oral ones shorter. Branchiæ arranged in five or six series, approximated on the back, four or fewer in each lateral row, green with white tips. Foot linear.

In twenty fathoms water, Isle of Man, and twenty-five fathoms, Cornwall (E. F.).

31. E. CŒRULEA, Montagu.

Doris cœrulea, MONTAGU, Linn. Trans. vol. ix. p. 78, pt. 7, figs. 4, 5.
Montagua cœrulea, FLEMING, Brit. Ann. p. 285.

Body (a quarter of an inch long) linear-lanceolate, green. Dorsal and oral tentacles of nearly equal length. Branchiæ ovate, green at their bases, blue in the middle, and orange at their tips, ranged in five or six rows, approximated on the back.

This species requires re-examination. It was taken by Montagu on the coast of Devon.

32. E. PICTA, Alder and Hancock.

Eolis pallida, ALDER and HANCOCK, Ann. Nat. Hist, vol. xi. p. 35.
„ *picta*, ALDER and HANCOCK, Monog. part 3, fam. 3, pl. 33.
„ *minuta*, (YOUNG ?) ALDER and HANCOCK, Ann. Nat. Hist. vol. xi. p. 36.

Body (half an inch long) ovato-lanceolate, yellowish white, spotted with tawny. Dorsal tentacles long, smooth, tinged and spotted in their middle portion with orange-brown, oral ones much shorter, similarly coloured. Branchiæ ovate, ampulliform, spotted with tawny and opake white, banded with yellow near their white acute tips, set in seven or eight transverse rows of five or six in each, the uppermost ones greatly the largest; back smooth. Foot obtusely angled.

Northumberland, Devon, and Dublin (Alder and Hancock). Menai Straits (E. F.). It inhabits the littoral and laminarian zones.

33. E. TRICOLOR, Forbes.

Eubranchus tricolor, FORBES, Malac. Mon. p. 5, pl. 1, f. 1 (bad).
Eolis tricolor, ALDER and HANCOCK, Monog. part 1, fam. 3, pl. 34.
„ *violacea*, ALDER and HANCOCK, Ann. Nat. Hist. vol. xiii. p. 166.

Body (an inch or more in length) ovate-lanceolate, yellowish or buff. Dorsal tentacles smooth, stout, fawn-coloured; oral ones shorter, paler. Branchiæ large, ampulliform, pellucid, orange below, violet centrally, and ringed with bright yellow near their tips, arranged in about thirteen transverse rows of from three to five in each, approximated on the back, very small at the sides. Foot lanceolate, obtusely angled.

In the coralline zone. Ballaugh, Isle of Man, twenty fathoms, and off Anglesea (E. F.). Northumberland (A. and H.). Belfast Lough (W. Thompson).

34. E. AMETHYSTINA, Alder and Hancock.

Ann. Nat. Hist. vol. xvi. p. 316.

Body yellowish. Oral and dorsal tentacles yellowish, the latter twice as long as the former. Branchiæ elliptical much inflated one way, and somewhat depressed the other; set in nine or ten rows of four papillæ in each, with granulated purple linear centres, and a broad ring of pale orange red near the tips. Foot linear, rounded in front, and a little widened for a considerable way backwards. Length three-eighths of an inch.

Under stones at low water-mark, Cullercoats (A. and H.). Very near the last species.

35. E. FARRANI, Alder and Hancock.

Ann. Nat. Hist. vol. xiii. p. 164, and Monog. part 1, fam. 3, pl. 35.

Body (three-eighths of an inch long) lanceolate, tapering behind, yellowish white. Dorsal tentacles smooth, linear, white below and above, orange centrally; oral ones half as long, similar in colour. Branchiæ ampulliform, white, straw-coloured centrally, and ringed near their tips with bright orange, set in nine or ten transverse rows of three to four papillæ in each, the outer ones smallest. Foot linear, anterior angles rounded.

Dredged at Malahide, near Dublin (Alder and Farran).

Section IV. TERGIPES.—Body linear. Tentacles smooth. Branchiæ in a single row on each side. Spawn kidney-shaped.

36. E. DESPECTA, Johnston.

JOHNSTON, Mag. Nat. Hist. vol. viii. p. 378, fig. 35 *c*, and Ann. Nat. Hist. vol. i. p. 153.—ALDER and HANCOCK, Monog. part 1, fam. 3, pl. 36.

Body (two or three lines long) linear, white with green centre. Dorsal tentacles long, smooth, stout, more or less tinged with red at the bases, oral ones two-thirds shorter, linear. Branchiæ large, oblong-ovate, centrally olive, often ringed with red below their white tips, distant, four on each side. Foot very narrow.

On the verge of the littoral, and in the laminarian zone on corallines. Berwick (Johnston); Northumberland and Argyleshire (Alder and Hancock).

37. E. EXIGUA, Alder and Hancock.

Ann. Nat. Hist. 2nd series vol. i. p. 192, and Monog. part 5, fam. 3, pl. 37.
Tergipes lacinulatus, LOVÈN, Ind. Moll. Scand. pt. 7.

Body (two-tenths of an inch long) linear, yellowish white, tinged with green. Dorsal tentacles linear, banded with olive, as are also the oral ones, which are not more than half as long. Branchiæ large, clavate, yellowish belted interruptedly with olive, and sometimes ringed near the apex with red, five or six on each side of the back, the foremost sometimes grouped in two or three. Foot linear.

Cornwall, on fuci and corallines in shallow water (Alder, Cocks).

The *Eolis plumosa* of Fleming described as half an inch in length, having a single row of simple linear branchiæ on each side, might be supposed to belong to this division, were it not that its discoverer (who found it in Zetland) states that the dorsal tentacula are "pinnated towards the dextral extremity."

EMBLETONIA, ALDER AND HANCOCK.

Body elongated, limaciform, not provided with a distinct mantle. Head produced at each side into a flat lobe. Tentacula two, sublateral; branchiæ subcylindrical, simple, usually arranged in a single, in part alternating, series down each side of the back. Orifices at the right side.

The number of tentacles distinguishes this genus from the section *Tergipes* of Eolis.

1. E. PULCHRA, Alder and Hancock.

Monog. pt. v., fam. 3, pl. 38, and (as *Pterochilus pulcher*) Ann. Nat. Hist. vol. xiv. p. 329.

Body (two-tenths of an inch long) oblongo-lanceolate, flesh-coloured, spotted with white. Tentacles short, blunt, smooth. Branchiæ large, elliptical, bright orange-red in centre, dotted externally with white, ranged in single file of five or six on each side. It varies in having the body colourless, and the branchiæ chestnut.

Coast of Bute (Alder); Ayrshire (D. Landsborough, jun.). It inhabits the littoral zone.

2. E. MINUTA, Forbes and Goodsir.

Plate B. B. B., fig. 5.

Eolidia minuta, FORBES and GOODSIR, Rep. of Brit. Assoc. for 1839 (vide Athenæum, No. 618, p. 647).

Body (one-eighth of an inch long) linear, pinkish-yellow. Tentacles longer than in the last, wrinkled. Branchiæ linear, vermicular, pinkish tipped with white, ranged in single file of seven on each side.

Dredged in seven fathoms among laminariæ, at Lerwick, Zetland (E. F.).

PROCTONOTUS, ALDER and HANCOCK.

Body ovate-oblong, depressed, acuminated behind. Head covered with a small semilunar veil. Dorsal tentacles two, linear, not laminated; oral tentacles two. Branchiæ papillose, ovate, arranged along the edge of the sides of the back, and continuous in front above the head. Vent central, on the posterior half of the back. Genital orifice at right side.

The animals of this genus have corneous jaws.

P. MUCRONIFERUS, Alder and Hancock.

Plate Z. Z., fig. 2.

Ann. Nat. Hist. vol. xiii. p. 161, pl. 2 (as *Venilia mucronifera*), and Ann. Nat. Hist. vol. xiii. p. 407.—Monog. pt. ii. fam. 3, pl. 42.

Body (half an inch long) ovate, broad and depressed, caudally produced, yellowish-brown, with darker spots and opake white specks on the back. Dorsal tentacles purplish-brown, stout, wrinkled, and somewhat tuberculated. Branchiæ inversely pyriform, colourless, tuberculated, arranged in twelve rows of three in each, the outermost ones very small; above the head are four branchiæ.

On a sponge in shallow water, Malahide, near Dublin (Alder).

ANTIOPA, ALDER and HANCOCK.

Body ovate-oblong, acuminated posteriorly. Head covered by a small veil. Tentacles four, two dorsal and two labial, the former lamellated and connected at their bases by an arcuated crest. Branchiæ ovate, ranged along the prominent lateral margins of the back, and continuous above the head. Vent central on the hinder portion of the back. Genital orifice at right side.

The crest between the dorsal tentacles markedly distinguishes this genus from *Proctonotus*. Like that group, the animals of it have corneous jaws. A full account of the anatomy of both these genera is included in the fifth part of the "Monograph of the British Nudibranchiate Mollusca." The genus is synonymous with *Janus* of Verany.

A. splendida, Alder and Hancock.

Plate B. B. B., fig. 6.

Alder and Hancock, Ann. Nat. Hist. 2nd Series, vol. i., p. 190.
Spence Bate, Notes on Fauna of Swansea, p. 7, plate 2.

Body (one inch and a quarter long) lemon-coloured, spotted on the back with blue, rather elongated. Branchiæ very numerous, large, and inflated, clothing the sides of the back, and passing round the front of the head, ovate, pale-buff, brown centrally, tinged with opake blue; they are ranged in thinly transverse rows of five papillæ in each. Oral tentacles short. Foot lemon-yellow.

Taken at Torbay by Dr. Battersby, and in Fowey Harbour, Cornwall, by Mr. Alder. Mr. Spence Bate has figured it from a single specimen taken by Mr. Moggridge, in Langland Bay, near Swansea.

HERMÆA, Lovèn.

Body elongated, limaciform, not provided with a distinct mantle. Tentacula two, auriform, involute; groove external. Branchiæ elongate, papillose, simple, arranged along the sides of the back. Vent in middle and anterior part of back. Generative orifice lateral, beneath the right tentacle.

The mollusks of this genus have no jaws. They form a link between the *Eolididæ* and *Elysiadæ*, and probably with *Stiliger* constitute a distinct family.

1. H. dendritica, Alder and Hancock.

Plate Z. Z., fig. 1.

Monog. pt. iv. fam. 3, pl. 40, and (as *Calliopæa dendritica*) Ann. Nat. Hist. vol. xii. p. 233.

Body (three-tenths of an inch long) ovate-oblong, attenuated behind, depressed and slightly expanded at the sides, greenish, with dendriform green lineations. Tentacles large, their anterior margins continuous with the sides of the head. Branchiæ long, cylindrical, with lobulated green centres and white-spotted surfaces, set in eight transverse rows of three or four in each.

Gregarious on *Codium tomentosum* in the uppermost part of the laminarian zone, at Torbay (Mrs. Wyatt).

2. H. bifida, Montagu.

Doris bifida, Montagu, Lin. Trans. vol. xii. p. 198, pl. 14, fig. 3.
Tritonia bifida, Fleming, Brit. An. p. 284.
Hermæa bifida, Lovèn, Ind. Moll. Scand. p. 7.—Alder and Hancock, Monog pt. v., fam. 3, pl. 39.

Body (nearly an inch long) linear, subcylindrical, yellowish, with two red lines at the base of the branchiæ. Tentacles rather short, their margins terminating at the sides of the head. Branchiæ ovato-lanceolate, transparent, reddish, with a crimson ramifying central vessel, numerous, unequal, and ranged in indistinct series.

Littoral and laminarian zones. Devon (Montagu); Belfast Bay (Getty and Hyndman); Leith (D. Landsborough, jun.); Sweden (Lovèn).

ALDERIA, Allman.

Body ovate-oblong, sub-convex, not provided with a distinct mantle. Head produced into a lobe on each side. No tentacula. No jaws. Branchiæ papillose, arranged in transverse rows on the sides of the back. Vent central on the hinder portion of the back. Genital orifice at right side.

This curious genus might form the nucleus of a distinct family. For a full account of its anatomy we refer to the paper by Professor Allman in the "Annals of Natural History," for January 1846, and to the fifth part of the "Monograph of the British Nudibranchiate Mollusca."

A. MODESTA, Lovèn.

Plate C. C. C., fig. 1.

Stiliger modestus, LOVÈN, Index Mol. Scand.
Alderia modesta, ALLMAN, in Ann. Nat. Hist. vol. xvii. p. 4.—SPENCE BATE, Notes, p. 7, pl. 1. fig. 1.
Alderia amphibia, ALLMAN, Brit. Assoc. Rep. for 1844.

This curious little animal was taken by Dr. Allman, in great numbers, in salt marshes, near Skibbereen, in the county of Cork. It has been figured by Mr. Spence Bate, from specimens taken by Mr. Moggridge and himself, in Loughor Marsh, near Swansea. He represents it of a pale yellowish colour; the branchiæ are longer posteriorly than in front. It attains the length of half an inch.

We place the following mollusk, in all probability representing a distinct family, provisionally in this position. In external aspect it resembles closely the *Pelta* of Quatrefages, and has a similar peculiar testaceous gizzard. The presence of branchiæ, however, is a marked distinction; one which could scarcely have been overlooked by the eminent French naturalist.

RUNCINA, FORBES.

Body elongated, limaciform, mantle distinct. No tentacula. Vent central on the posterior portion of the back, beneath the margin of the mantle and accompanied by few, slightly pinnate branchiæ. Generative organs on the right side.

R. HANCOCKI, Forbes.

Plate C. C. C., fig. 2.

PELTA, sp.? ALDER and HANCOCK, Ann. Nat. Hist. vol. xviii. p. 289. pl. 4, figs. 1—3.

Body smooth, about two lines long; cloak a little indented in front, black, except in front and behind, where it is buff, sprinkled with brown. Eyes large on anterior portion of cloak, in the midst of pale spaces, a curved line of white spots behind the eyes. Vent beneath the posterior margin of cloak; branchial plumes three, small, slightly pinnate, near it, and projecting a little from under the cloak. Tail extended one-fourth of the length of the body behind the vent. Foot yellowish, with reflexed sides.

In pools near high-water-mark, on *Confervæ*, at Torbay (Alder and Hancock).

ELYSIADÆ.

This family constitutes the order *Pellibranchiata* of Alder and Hancock, a most natural group, distinguished by important anatomical characters, and a peculiar external habit. It consists of naked sea-slugs, whose structure has close relationship with that of the *Nudibranchiate* orders, but differs materially, insomuch as the respiratory function is effected by the whole surface of the body, which is entirely clothed with vibratile cilia. The usual aspect of these little creatures reminds us of a land slug. In some tentacula are conspicuously developed, in others they are obsolete. For an excellent and detailed account of their anatomy we must refer our readers to a paper by the authors above cited, contained in the first volume of the second series of the "Annals of Natural History."

ELYSIA, Risso. ACTÆON, Oken.

Animal depressed, oval, with lateral aliform expansions produced beyond the posterior extremity of the body, where they unite with one another along the mesial line. Head distinct, bearing two conspicuous auriform tentacula, behind which are two rather distinct eyes. Vent placed centrally on the hinder part of the back. Genital orifice at the right side. Foot narrow.

E. VIRIDIS, Montagu.

Plate C. C. C., fig. 3.

Aphysia viridis, MONTAGU, Lin. Trans. vol. vii. pl. 7, f. 1.—FLEMING, Brit. Ann. p. 291.
Acteon viridis, QUATREFAGES, Ann. Sc. Nat. 3rd series, vol. i. page 138.—ALLMAN, Ann. Nat. Hist. vol. xvi. p. 146.

Body and expansions bright green, variegated with groups of green, blue, and rose-coloured lustrous specks. Tentacula dull purple. A colourless space around the eyes. Length, nine lines.

An inhabitant of the laminarian zone, usually on *Codium tomentosum* or *Zostera marina.* Devon (Montagu); on the coast of Cork County (Allman); Arran, in Scotland (Rev. D. Landsborough).

LIMAPONTIA, JOHNSTON.

Animal limaciform, depressed in front, rounded and elevated behind. Head distinct, bearing two lateral crests instead of tentacles, at the hinder ends of which are the eyes. Vent dorsal, a little behind the centre of the back.

This genus is identical with *Chalidis* of Quatrefages.

L. NIGRA, Johnston.

Plate C. C. C., fig. 4.

Limapontia nigra, JOHNSTON, Loudon's Mag. Nat. Hist. vol. ix. p. 79—ALDER and HANCOCK, Ann. Nat. Hist. 2nd series, vol. i. p. 402, pl. 19, fig. 4, 5, 6. — SPENCE BATE, Notes on Fauna of Swansea, p. 7, pl. 2. fig. 4.

Body (one line and a-half long) brownish-green or black, rather depressed, the sides slightly overhanging the foot. Head truncate in front, flat and crested at sides.

Eyes large, at the posterior extremity of the crests, within a pale space, which is continuous on the crests. Foot yellowish, narrower than body.

Berwick Bay (Johnston). Gregarious and feeding on *Confervæ* in small pools above half-tide, at Falmouth (Cocks); Cullercoats, in similar situation (Alder); and Whitburn (Howse); Loughor Marsh, near Swansea (Moggridge and Spence Bate).

ACTEONIA, Quatrefages.

Animal limaciform. Head large, distinct, crested at the sides, the crests prolonged behind into two short tentacles, behind which are two eyes. Vent dorsal, placed centrally on the back.

A. corrugata, Alder and Hancock.

Plate C. C. C., fig. 5.

Ann. Nat. Hist. 2nd series, vol. i. p. 403, pl. 19, figs. 2 and 3.

" Body limaciform, black, depressed, somewhat bulged at the sides, and covered with regular wrinkles like an *Arion*. On each side of the body there is a slightly elevated ridge, with a few pale tubercular spots. Head carinated at the sides; each carina produced above into a short, flat, ear-like whitish tentacular process. Eyes in circular palish spots at the posterior extremity of the ridges. The posterior extremity is obtuse and pale; there is also a palish spot near the centre of the back. Foot linear. Length one-eighth of an inch."

Found by Mr. Cocks along with *Limapontia nigra*, in the same situations at Falmouth.

CENIA, Alder and Hancock.

" Animal limaciform; the back elevated; head slightly angulated and bearing two linear tentacles on the dorsal aspect, behind and exterior to which are the eyes. Vent a little behind the centre of the back."

C. Cocksii, Alder and Hancock.

Plate C. C. C., fig. 6.

Ann. Nat. Hist. 2nd series, vol. i. p. 404, pl. 19, fig. 1.

Body black above, fading into fawn-colour at the sides. Head with a black central stripe, fawn-coloured (as well as the tentacles and the spaces around the eyes) at the sides. A slight ridge, with three or four pale tubercular spots on each side of the back in the region of the vent. Tentacles cylindrical, obtuse. Length, three-sixteenths of an inch.

Discovered by Mr. Cocks on sea-weeds, in pools, between tide-marks, at Falmouth.

END OF THE THIRD VOLUME.

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